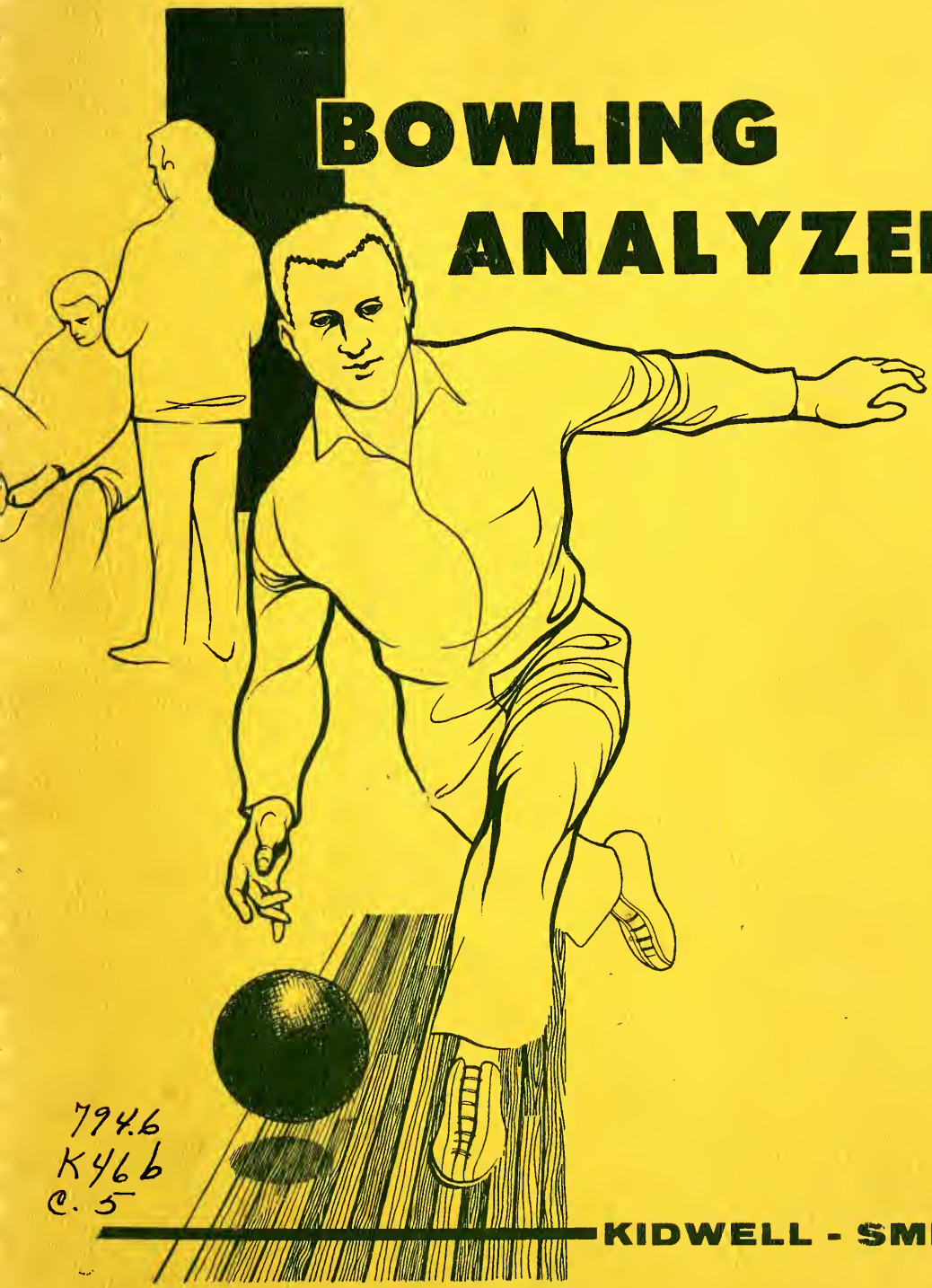
BOWLING ANALYZED



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BOWLING ANALYZED

PHYSICAL EDUCATION SERIES

Edited by AILEENE LOCKHART,
University of Southern California, Los Angeles, Calif.

BOWLING ANALYZED

by

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Preface

Bowling Analyzed grew from the requests of students of the authors while they were teaching bowling and professional physical education classes at the University of Washington. Many of these students were preparing for a career of teaching in physical education and expressed a need for a book on bowling which could be used as an instructor's manual, a text, or a ready reference for the beginning, intermediate and advanced bowler. This volume was undertaken to fill that need, and in its pages will be found both detailed analyses of the techniques of bowling and specific methods of presenting material.

The authors are aware of the many varied and ofttimes successful methods of teaching bowling, and they wish to emphasize that the ideas presented here are not laid down in a dogmatic way; rather, they are offered as sound and tried practical procedures.

Today, a strong trend in all education moves in the direction of education for social living in a democratic society. To be socially efficient, an individual needs certain recreational skills in such activities as dancing, swimming, golf, and bowling. These skills are a part of the equipment of any well-rounded person. The authors hope that this book will serve a double purpose: (1) that of preparing teachers for an important and pleasurable part of the school program and (2) that of interesting the intelligent amateur who wishes to improve his own skill and, consequently, his enjoyment of one of the grandest of the popular sports.

The authors are fully cognizant of the importance of photographs and diagrams in bringing an activity book to life. Therefore, an expression of sincere appreciation is in order to Mr. E. F. "Whitie" Marten, Supervisor of the Still Photography Unit, University of Washington for the photographs and to Mr. and Mrs. Hugh Pape of Seattle for their art work.

Kathro Kidwell
Paul Smith, Jr.

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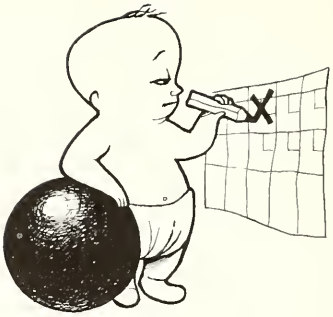
chapter 1

The Importance of Beginning Correctly



Many people, when first starting to bowl, decide to postpone taking private lessons or class instruction until they have gained some proficiency. They feel that the embarrassment of facing an instructor would then not be so great and also that it would not be necessary to take as many lessons.

The fallacy of this assumption lies in the great odds against getting a correct start by oneself. The learner attempts to copy the delivery of someone he sees and his model may or may not have good bowling form. He sees a person throwing a "cannon" ball and is impressed with the tremendous speed. He notices a bowler taking a certain number of steps and swinging the ball in a particular way, but he does not realize that these movements should be smooth, rhythmical, flowing and synchronized. Nor is he aware that, even though the model has acceptable form and rolls the ball well, it is difficult to copy these movements for the beginner is unable to feel, see, or analyze his own faults. Neither does he understand that bowling form may differ with individuals. It may be disastrous for beginners to start on their own, for in such circumstances, they may begin to develop or even perfect faults that later become almost impossible to change.

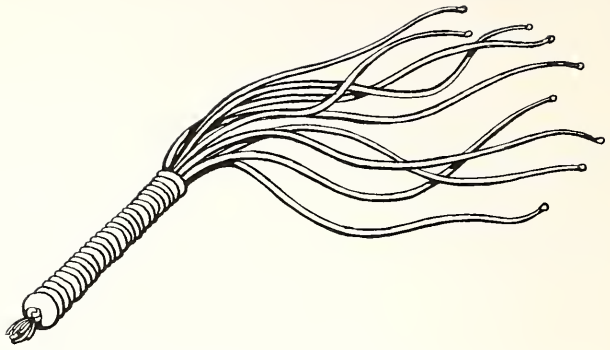
Why flounder around? Avoid the necessity of having to correct imperfections. Even then the road to success may be long and rough, but if a beginner takes expert instruction and advice willingly, learns to analyze and correct his faults, has the proper attitude, and spends considerable time practicing, he should progress smoothly and derive much joy from bowling.

True, a person may become an outstanding bowler in spite of certain faults, because with persistent practice various compensating adjustments may be made, either consciously or unconsciously. Success may thus come despite these faults. The form presented within these pages is considered by experts to be the most natural for the average person. It should assist a beginner to become a better bowler much more quickly than trial and error experimentation. When a smooth, rhythmical, natural style has been developed, a bowler should not experiment with too many changes.

Who would attempt to fly an airplane or drive a car without proper instruction? It is granted that mastery of these activities involves safety as well as skill. But bowling requires physical coordination that becomes automatic with experience, just as does the skill that is necessary in flying a plane or driving a car. It is folly to "fly by the seat of the pants," when instruments are available to give reliable direction. The same is true of bowling. Why struggle with trial and error methods, when there is an easier, more direct and scientific method of attaining better results in a shorter time? An old Chinese proverb says, "Wise men learn from their own mistakes, but the wisest men learn from the mistakes of others." A weak foundation may cause the structure to fall. The importance of starting correctly cannot be overemphasized.

chapter 2

Class Organization



Lack of campus facilities should not preclude the inclusion of bowling in a regular school physical education program because commercial alleys are usually near by. Since classes utilize hours least popular for recreational bowling, most alley managers welcome an arrangement for class instruction.

Arrangements for Facilities

Regardless of whether commercial or campus lanes are used, arrangements between the physical education department and the alley manager are of crucial importance, and a definite understanding should be reached before classes are started regarding the responsibilities of each party. It is an added protection if these policies appear in written form.

Following is a list of some items most commonly included in any statement of policy:

Cleanliness of the establishment (most bowling alleys are above reproach in this respect)
Number of pairs of shoes, and their sizes
Balls of various weights, and their numbering
Fee per individual
Supply of score sheets and lockers
Employee able to make minor emergency repairs.

During class instruction all lanes should be reserved for the exclusive use of the physical education department; otherwise, general group instruction is difficult if not impossible. Arrangements should be made for the convenient showing of films and filmstrips. The instructor should inform the alley manager of school holidays, changes in schedule, and examination periods.

Fees

Since most instructional bowling programs utilize either commercial or student union building alleys, students registered for these classes pay a nominal sum for the use of the facilities. This practice follows the generally accepted pattern of charging a fee for certain laboratory courses and arouses little controversy. The fee may prevent a few persons from registering for bowling, but if interest is strong, most students seem to find a way of surmounting this obstacle. They appreciate the opportunity of receiving both instruction and practice for less than the regular cost of recreational bowling.

Fees vary, depending on the length of the course, the number of sessions, and whether hired pin setters, class members, or automatic pin spotters are used. Frequently, shoe rental is a separate item. Some schools charge a fee that includes both the cost of bowling and shoe rental. Whatever method is used, the fee should be collected during the first or second meeting of the class, and a receipt should be given to the student.

The Instructor

Who should teach these bowling classes -- men or women? Either! Whoever is chosen must be highly competent in his technical knowledge of the sport and in his ability to present the material. He should be a well-adjusted person in his own social life and should have developed a philosophy based on firm beliefs and principles. He must understand people, both as individuals and as functioning members of a group. He must have a sincere interest in students and their needs. Respect for personality, friendliness, and concern for others are particularly important when dealing with youth. Many of these young people suffer the pangs of insecurity, and strive for group acceptance and social recognition.

In segregated classes, the general practice is to have a man instructor for the boys' classes and a woman for the girls' classes. In coeducational sections either a man or a woman can be chosen. The decision rests wholly on the professional competency of available teachers. Ideally, both a man and a woman should be assigned to each class, but few schools can be so lavish with personnel. It is strongly recommended that a regular member of the physical education department be assigned to teach bowling.

Size of Classes

In organizing bowling classes many factors are determined by local regulations. Although one authority maintains that one instructor can teach one hundred boys and girls in one hour, such a large group is undesirable for an instructional class. In a class of more than forty-five students, individual help, which is essential in bowling, becomes an impossibility. If twelve to sixteen lanes are available, it is desirable to assign only three or four students, never more than five, to each alley.

Season

Bowling is not seasonal. It can be presented throughout the entire school year. However, since this activity is more popular in the fall and winter than in the spring, more sections should be offered during those months.

Length of Period

The length of the bowling period is determined by the distance students must travel. If the alleys are off campus and require much time en route, one satisfactory arrangement is to have each student register for bowling during a two-period block of time. This insures enough class time for each member to complete at least one full game. Even with four persons on an alley, a game can be finished in a forty-five minute period. After the first few class meetings, students should be encouraged to start practicing or bowling a game as soon as two members of their assigned group arrive. Such promptness in starting avoids delay and waste of time. Neither should all members of a class leave at the same time. If some wish to stay, it indicates that the instructor has achieved one of the objectives of the course, student interest. The only requisite is that alleys be clear for the group or class that follows.

Policies

Many factors governing certain phases of the bowling program will be predetermined by rules and regulations of the specific institution. Policies in regard to absences and make-ups should follow the pattern of other physical education activities. However, the bowling instructor who is allowed to establish his own rules will avoid much difficulty if he does not permit make-ups. Students take advantage of such permission and, in already crowded classes, one or more additional people disrupt the normal routine of bowling and lesson progression.

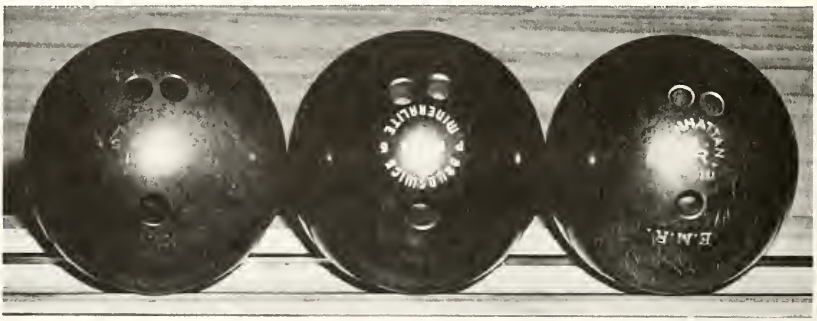
Selection of Ball

Seldom will there be enough balls available for each member of a class to have one assigned for his individual use. Fortunately, one ball may be used by two or more players on the same alley. A student should, however, use the same ball for the entire course, unless, after a few

lessons, he discovers that his first choice was not satisfactory. The method of selecting a ball that fits properly needs to be explained and demonstrated. Balls vary in weight; many women use balls of twelve to fourteen pounds while most men use a sixteen pound ball. Each person should choose a ball that feels comfortable, neither too heavy nor too light. The span (distance between thumb and finger holes) is even more important than the weight. It is impossible to release the ball correctly and easily unless the span fits the individual's hand. When the span is too wide, the muscles of the hand become strained and uncomfortable; if too narrow, the fingers are pinched and the ball may be released too soon. A third item in choosing an alley ball is the size of the holes. When the holes are too large, it is difficult to hold the ball properly; when too small, fingers become irritated and scraped. Most bowlers prefer a ball with three holes (instead of two) into which the thumb, middle finger, and ring finger are inserted. The thumb hole should be loose enough for comfort but tight enough for the thumb to maintain a slight contact with the edge of the hole. The other fingers fit with the same degree of looseness. Holes that are too loose are better than holes that are too tight. To check the fit, insert the thumb about three-quarters of its length into the proper hole, and extend the middle and ring fingers across their respective holes. The middle knuckles of those fingers extend approximately one quarter of an inch beyond the inside edge of the finger holes. Most alley balls are made with the "conventional" grip, but when an individual purchases his own ball he may have the span, size of the holes, and the pitch (slant of the holes) bored to fit his hand. Here the left-handed bowler needs special consideration. For him, finger holes should be reversed from those of the right-handed bowler. However, since few alley balls with this grip are supplied, there is little value in discussing the point in a beginning class.

A B

Figure 1. Correct ball fit. A, right-handed bowler. B, left-handed bowler.



A B C

Figure 2. Grips. A, conventional. B, off-set. C, left-handed.

After each student has had an opportunity to try the fit of several balls and to choose one, he should sign for that ball by number at the alley where it belongs. That ball is his to use for the rest of the course. This procedure assigns each student to a particular alley and specific ball (except for a few later adjustments) and saves valuable class time during the course. It is not necessary for each member of the class to have a different ball; one ball can be used by all players on the same alley, although such a practice slows the play somewhat.

Alley Assignment

Skill classification is a complicating factor in assigning students to permanent alleys. Unfortunately, sections do not always contain only beginners. Whenever possible, certain sections should be restricted to beginners and other sections opened to experienced bowlers. When this plan is not possible, a block of alleys is assigned to beginners and experienced bowlers are grouped on other lanes.

Alternation of Alleys

Because of the fixed positions of ball return racks, posts, and walls, it is not advisable to have students bowl on one alley throughout the quarter or semester. Several solutions are possible:

1. At mid-term have the students on one alley change with the group on the adjacent alley.
2. At each class meeting have the students progress one alley.
3. Alternate alleys during each game as in league bowling.

Safety

Some items of safety need particular emphasis. When a ball is removed from the return rack, it is lifted by placing one hand on each side of the ball, parallel with the rack. This hand position prevents fingers being crushed by a ball that is still rolling into place. The "cradle" of the return rack slows down all balls coming from the pits, but there is still enough forward momentum to cause serious discomfort, if not actual damage, to the fingers of a careless bowler.

Figure 3. Removing ball from return rack, correct method.

Figure 4. Removing ball from return rack, incorrect method.

It is dangerous and distracting to retrieve a ball from the rack after a bowler on the adjacent alley has taken his stance. It disturbs the bowler's approach, and the person leaning over the rack may be hit by a ball.

Only the approach area of one alley should be used by a bowler. If his foot swings wide to either side or if he edges over in an attempt to steer the ball with "body English," he is interfering with his neighbor and may be hit.

Everyone must remain seated when not actually bowling. There is danger of being hit by a bowler executing a backswing, or, in a beginning class, a ball may be dropped on the backswing. Alertness and consideration for others will prevent most accidents and will mark a person as an experienced kegler instead of a novice.

Skill Classification

Classification into beginning, intermediate, and advanced ability levels presents a problem. Those who never have bowled are a joy; they are beginners without bad habits in need of correction. Students who have bowled, but who have had no formal instruction, are difficult to classify. They are not beginners, but they are the ones most apt to have unorthodox form and to be weak on scoring fundamentals. One workable solution is the following division: beginners -- those who have bowled very little or not at all; intermediates -- those who passed beginning bowling with a skill mark of D, C, or B (this does not include grade on written examinations), or those with no previous instruction but with an average of one hundred or better on their first four games in class; advanced -- those who passed intermediate bowling, or those who received a skill mark of "A" in beginning bowling. Jumping the "A" student from beginning bowling directly into an advanced course gives intermediate bowlers a better opportunity to compete with students of comparable skill.

Clothing and Equipment

Present-day sports clothing is an acceptable costume for bowling classes. Girls should wear a full (but not too full) skirt, and a washable, cotton blouse. Regulation bowling shoes are essential and can be rented at the alley. Any student who can afford it, and who plans to continue bowling, should be encouraged to purchase his own shoes.

Figure 5. Personal equipment.

It is unnecessary for the individual to own a single piece of equipment. However, as soon as a person becomes an ardent kegler, his expenditures begin. Prices differ in various sections of the country, so the following information is only approximate: (Figure 5.)

Shoes range in price from $5.00 up
Shoe bags start at $2.00
Combination ball and shoe bags are $6.00 and up
Balls cost $25.00 or more

According to American Bowling Congress rule, balls may not exceed twenty-seven inches in circumference nor sixteen pounds in weight.

When a ball is purchased, exact measurements are taken so that the holes will be bored to fit the individual's hand. By purchasing his ball from an expert, the bowler is assured that the span, and the size and pitch of the holes are correct for him.

Grading

Bowling classes should be separated into beginning, intermediate and advanced sections, but if segregation is impossible, divisions within the class can be made. If a beginner and an advanced bowler are assigned to the same alley neither student is inspired to the capacity of his ability. The beginner is discouraged by the competition, and the advanced bowler loses interest for lack of stimulating challenge.

A similar situation arises in grading unsegregated classes if grades are based entirely on averages. Advanced bowlers may tend to loaf, and beginners may feel they have no chance to compete on an equal basis. But, since the ultimate aim in bowling is to topple the pins, the average score bowled in the course should be a consideration in the final grade. It would not be fair to the beginner to use the average as the entire grade, but some instructors do weigh averages more heavily than other factors.

If a generally accepted bowling form is taught, it is feasible to grade the student at least partially on his ability to reflect this instruction. Form cannot be graded on the basis of one observation. The instructor must study each student, objectively analyzing the fundamentals of stance, footwork, synchronization of movement, release and follow through. This analysis should be made on several occasions and in each case, without reference to the preceding evaluations. Because the student may be at his best or off his form momentarily, the student should make several deliveries during each observation. Form is important to the beginner in getting a correct start in any activity; therefore it is a consideration in grading. Instructors must realize that there are many accepted styles and that a natural, flowing movement is more essential than mechanical perfection.

Improvement has been a somewhat controversial aspect of grading activities because of its subjectivity. Experience in analyzing and rating bowlers will gradually increase the instructor's ability to evaluate by observation. Improvement in bowling can be based on at least two factors, form and average. Three or more times during the course each student should be given a form evaluation. At the end of the course when these grades are compiled, they not only give the instructor an overall picture of the students' form but also indicate those who have progressed steadily.

Another phase of a student's improvement can be based on the objective cumulative daily average. Consider, however, that during the length of a normal course of twenty to thirty meetings, a high-average, experienced bowler would not be expected to increase his average nearly as much as would the low-average or beginning bowler. Examination of the first few games recorded for each bowler is necessary to be sure that no single game, either extremely high or low, results in a distorted picture of improvement. The early games should be reasonably consistent, but, if an exceptional game in either direction does occur, it should be disregarded for purposes of using these games as a starting point to measure improvement.

Written examinations may be used to determine the student's knowledge of fundamental skill, rules, etiquette, terminology, scoring, etc. Samples of written examination questions may be found in a later chapter. Practical examinations tend to measure the student's ability to bowl under pressure. One practical type of test is to have each student roll two balls at each of five leaves and to score an assigned number of points (usually three or five) for each conversion. Another method has students attempting to knock down three or more pins of the 1-2-3-5-7-10 leave three times in five attempts. The handicap system in bowling serves as a great equalizer and affords the novice an opportunity to compete on reasonably equitable terms with the veteran.

A three game handicap tournament at the end of a course stimulates an interest in competition that cannot be accomplished on a scratch basis. Bowling lends itself to objective grading of a student's ability better than many activities because, even in a heterogeneous section, the instructor can grade each student by using all or any combination of the factors mentioned above.

chapter 3

Pinsetting Machines, Pins and Lanes

Many bowlers can remember when each pin was reset by hand. Soon came the rack which was lowered by hand; then the semiautomatic rack (lowered by motor); the automatic ball return; and now the completely automatic, mechanical genius that does almost everything except make strikes and spares for the bowler. For commercial establishments, these noisy monsters are a boon; for the instructor, they present problems which can be overcome only by careful planning.

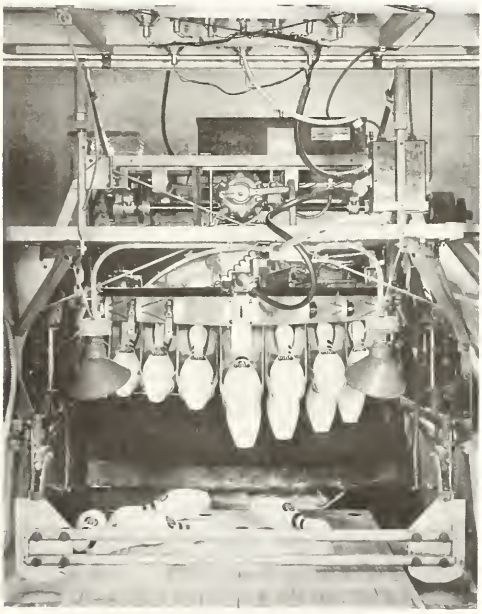


Figure 6. Automatic Pinspotter.

Automatic Machines

A part of any class instruction should be devoted to practice at certain selected, designated leaves. At present, the machines are not built to set up such combinations. Therefore the teacher has to use ingenuity in devising methods of presenting information about converting various leaves to spares and in working out possible ways of having the class practice at other than a full set of pins.

A chart of the pin deck, drawn to scale and showing the tenpin spots, can be used to great advantage. If this chart is made on oilcloth, it can be stored easily in a small space when not in use. Such a chart can be placed on the approach and actual pins can be arranged on it in any desired pattern; a ball can be placed in its correct relation to those pins, and the ball's path can be indicated by a pointer, yardstick or similar article. Changes which the bowler must make in his starting position can also be shown. Then, in an actual game, when these combinations remain standing, the instructor can help the student recall the "chalk talk" session, reminding him of where the ball should hit, its path en route, and how to adjust his starting position.

Another method requires the complete cooperation of the students and the ability to bowl at pins that may not be standing. For example, early in the course, students may be

bowling at the 1, 3, 5 pins only. With automatic machines all ten pins will be standing for the student's first ball. He should be cautioned to roll only at the 1, 3, 5. After this ball, any combination of pins may be left, but with his second ball, the bowler again should aim only at the 1, 3, 5 spots regardless of whether or not those pins are standing; all other standing pins are disregarded. This same method can be used for any combination the instructor chooses.

Before the advent of the automatics, any desired combination could be set up, and this part of the learning period was, perhaps, easier for both instructor and pupil, but progress always brings change. Each instructor must continue to develop his own methods of presenting the information, skills, and techniques which will enable those in his classes to improve their averages, thereby increasing their enjoyment of the sport.

Still another problem arises when, in the same establishment, some lanes are equipped with automatics and some are not. In addition to employing the methods previously suggested, or other appropriate adaptations, the instructor will want to rotate his class so that everyone will spend an equal amount of time on each type of alley. This rotation should be made every week or every two weeks rather than at each class period. The disadvantages of changing alleys each session are twofold: there is more confusion and the students who set pins on the semiautomatic alleys would not have had an opportunity to practice the techniques presented on that particular day.

Semiautomatic Machines

If the alleys are not completely equipped with automatic pin setting machines, the techniques of pin setting will have to be taught to all members of the class. In this case, the entire class is taken to the pits for an explanation and demonstration of pin setting before anyone is permitted to deliver a ball. Setting pins, even with semiautomatic racks, is strenuous and requires a definite technique and coordination. It is advisable to present pin setting procedures even if professional pin setters are used. Only in this way is the novice made aware of the dangers confronted by the setter if the bowler is careless. The instructor must be notified immediately of any accident, but if safety is emphasized, there is little danger of injury to the pin setter.

Safety

One obligation of the bowler is to see that the pin setter is out of the pit before starting his delivery. A dangerous practice is "double balling" of which there are two forms: (1) delivering a second ball before the pin setter is out of the pit; (2) rolling a ball simultaneously with the bowler on the other side of the ball return rack. Neither form must be permitted. The pin setter, too, has his responsibilities and, just because the bowler is considerate, the pin setter cannot be less cautious. He is the one who stands to lose if hit by a fourteen to sixteen pound ball or a flying pin. A periodic glance up the alley is wise when setting pins; because so many details of position, stance, footwork, swing, release, follow-through, and aim occupy the bowler's thoughts that mistakes sometimes occur. Light colored clothing is recommended for students who are setting pins. Dark colors tend to blend with the background of the black leather pit cushion and increase the danger of visual error.

The setter must keep his feet and legs out of the pit except when placing pins into the rack. The cushion support at the rear of the pit provides a natural place to sit while awaiting the bowler's delivery. During this brief idle period, the pin setter sits on the cushion support and raises his feet to keep them from being hit by the ball or flying pins. His feet may rest on the ledge where he is sitting, on the kickbacks bordering the pit, or in the cut-out section behind the ball return. The pin rack should never be used as a foot support because continuous pressure eventually affects the alignment, resulting in the rack spotting the pins off-center.

Students should be permitted to set pins on one alley only, but the instructor explains that professionals manage two alleys at a time. In recreational bowling outside of class, the student may experience the use of professional pin setters. He should know that the expert, in stepping through the cut-out area behind the ball return to the adjacent alley, is not out of his pit until both feet are completely out of sight. The specialist in the pit sometimes steps into the adjoining alley with one foot, leaving the trailing leg in the original pit until he has filled his hands with pins. As

he lifts the pins to place them in the rack, the trailing foot disappears from sight. Then, and then only, should the bowler start his approach. Pit lights should be on to insure clear visibility.

Locations of all switches controlling the automatic equipment should be pointed out to the students, and an explanation and demonstration given of the machinery they control. This includes semiautomatic or automatic pin setting racks, automatic ball returns, and automatic foul lights. The old style racks had a lever extending from one side to the other approximately chest high. The operator placed the pins in the rack and, using his back muscles, pressed down forcefully on this lever which, in turn, lowered the rack to spot the pins. The semiautomatic rack is a motor driven replica of the manual type. The operation is the same except that a motor replaces the lever and merely pulling a cord sends the rack into action.

Balls may be returned either manually or automatically. If the ball is returned manually, it is lifted to the ball return and started on its way by the person setting pins. Students must be cautioned to keep their hands off the return rack to prevent having a ball from the next alley placed on their fingers. If the ball return is automatic, the pin setter pushes the ball into an opening on the low, forward side of the pit floor. The ball comes to rest on a switch which electrically lowers a lever, mechanically picks up the ball, and starts it down the ball return. Students must keep their hands and feet out of the ball return hole while the motor is running. The force with which the shield lowers may be demonstrated by pressing the top of a pin on the switch in the opening. The force of the falling lever is clearly shown by the chopping sound and the resulting dent in the hard maple surface of the pin. If a flying pin enters this opening, the motor for the ball return must be shut off before the pin is retrieved.

Pin Setting Techniques

At first, students should be instructed to pick up only the number of pins that they can handle comfortably. Girls can easily pick up three pins at a time; with practice they can manage four. Boys can usually manage five or more pins at once. The floor of the pit slopes forward (toward the alley) so there is less chance of pins or ball being underfoot if the pin setter jumps straight down into the pit.

The pin setting routine starts when all pins are spotted and the person doing the setting takes his position on the cushion support. When the first ball of a frame has been rolled, the pin setter slides into the pit, returns the ball, sweeps the toppled pins from the alley deck, lifts the pins from the pit, and places them in the rack over vacant spots. Returning to his perch on the ledge, the pin setter watches the bowler through the louver opening above the rack until the next delivery. When the second ball of a frame is in the pit, the setter first returns the ball, then completes racking, and respots the pins. This method saves a great deal of time because each bowler awaits the return of his ball before rolling at the remaining pins. If the ball is returned first, it reaches the bowler by the time the pin setter has racked the pins. Picking up the pins and returning the ball in the proper sequence becomes automatic with a little practice and concentration.

Each pin setting rack is provided with a small lever that if pulled back at the proper time (when the rack is flush with the pin deck), will lift all pins from the alley at once. This lever is used to pick up the pins when bowling on an alley is terminated for any period of time. Pins should always be left in the rack and with the rack in the top position. Frequently a novice pin setter will respot all pins following the first delivery of a frame. The bowler should then place his ball on the approach to indicate a pin setting error. When the pin setter has acknowledged his mistake, the bowler will motion or call out by number the pins that were left standing. If these were few in number, it is more efficient to remove all the pins by using the pick-up lever than to clear the pin deck by hand. The designated pins are then respotted manually. After the pick-up lever has been used, pins not carried by the second ball should be removed from the alley and replaced in the rack by hand. Lowering the rack for the following frame automatically releases the pick-up lever. If any mechanical trouble develops, the student pin setter must turn off the motor which controls the equipment and call the instructor.

During this explanation of pin setting, it is helpful to have someone roll several balls down the alley so that the instructor can go through the actual process, step by step. This gives a visual demonstration and has the added advantage of acquainting students with the noise they will

encounter later. This is an opportunity for the instructor to emphasize the unique educational advantages of pin setting. An alert pin setter observes the form of the bowlers on his alley; he notices the results of an incorrect approach or follow-through. From his vantage point, the student in the pit learns that pins are farther apart than they appear from the foul line, and that many so-called "pocket hits" do not necessarily terminate in a strike. Some of these hits are too full or too thin. He has the opportunity to study various leaves and soon discovers the point of impact that converts them to spares. The pin action resulting from various types and speeds of balls can be observed most effectively from the pits. Probably the most important lesson a student pin setter learns is consideration for others; he should never be guilty of "double balling." Just as boys who caddy in golf learn all aspects of the game, students who work in the pits become better educated bowlers.

Pin Setting Rotation

If class members set pins, an equitable rotating system must be followed. There are several acceptable methods, but each person must take his turn at setting. If four or five students are assigned to each alley, a regular rotation plan can be established with a different pin setter for every class meeting. This may be done alphabetically or by making a chart. With this plan, the student knows in advance the exact days during the course when he will be setting pins. Sometimes absences on pin setting days cause confusion, but the instructor can substitute another student from that alley. When the absent student returns to class, he fills in for the setter who substituted for him. If there are only three bowlers per alley, the same system can be used; or, one person can set pins while the other two bowl a line. At the end of a game, pin setters change. The advantage of the latter system is that each bowler does some bowling every day. When new material is presented, each person practices the skill on that particular day; one person on each alley does not have to wait until the following class period in order to practice. Generally, students prefer to remain in the pits for a full period rather than change during the hour. It is neither necessary nor desirable to wear bowling shoes while setting pins.

In a coeducational bowling class, if hired pin setters are used, there is no problem; but, if members of the class set pins, safety demands a carefully planned system. A girl should not set pins for boys because sometimes a boy rolls such a fast ball that there is danger from flying pins. One possible solution is to have boys and girls bowling on each alley, but have only boys set pins. Such an arrangement has two disadvantages: (1) boys have less bowling time; and (2) girls are deprived of the valuable pin setting experience. A better method is to assign boys and girls to alternate alleys. Thus, boys set for boys and girls for girls, yet opportunity is provided for all to benefit from the advantages of a coeducational class. In a surprisingly short time most students become quite skilled in their ability to set pins and accept their turns in the pits philosophically.

The Pins (Figure 7.)

Regulation bowling pins are constructed of one or more pieces of clear, hard maple. They are fifteen inches high, two and a quarter inches in diameter at the base and just under five inches (4.775") in diameter at the belly. A pin can weigh no less than two pounds fourteen ounces, nor more than three pounds ten ounces (approximately three to three and a half pounds), but pins in any one set can vary no more than four ounces.

Pins are spaced twelve inches apart from center to center and are arranged in the shape of a triangle with the apex toward the bowler. The head pin (nearest the bowler) is pin number one. The remaining pins are numbered consecutively in rows from left to right. (Figure 8.)

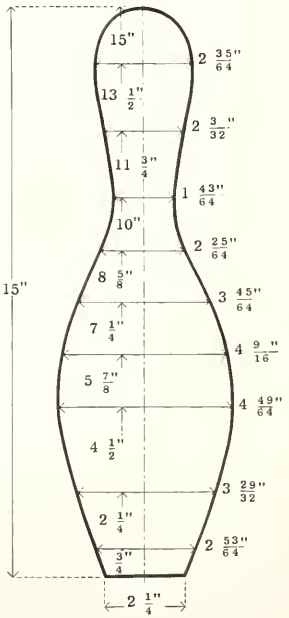


Figure 7. Pin dimensions.

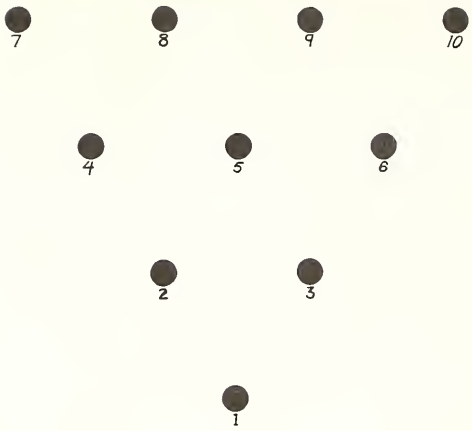


Figure 8. Pin deck.

All bowlers know the pins by their numbers. This knowledge does not improve the mechanics of a bowler's game, but he is a better informed and educated bowler for learning them. The numbers and positions of pins should be memorized early because there are frequent references to them in aiming, in playing spare leaves, and in many other phases of the game.

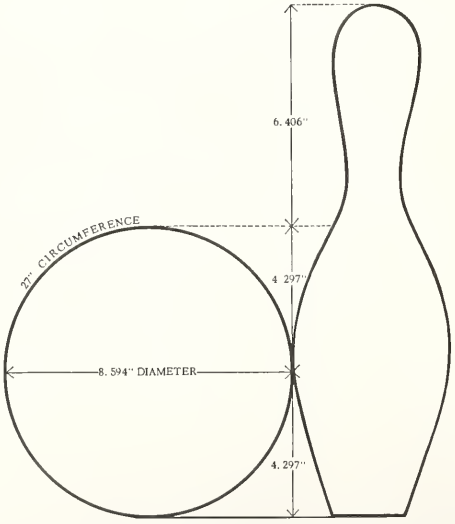


Figure 9. Relative size of pin and ball.

The Alley

A brief explanation of the alley is presented in order to familiarize bowlers with its areas, with their relationships to each other, and with certain terminology. Since the term "alley" embraces many essential items, each item is presented with a brief explanation. (Figure 10.)

The approach is a clear, level runway, a minimum of fifteen feet in length, which extends from the foul line toward the seats and on which the bowler takes his stance and makes his delivery. The foul line is a horizontal mark separating the alley bed from the approach. If the bowler comes in contact with anything beyond the foul line, a penalty is inflicted. The ball is rolled on the alley bed which is sixty feet long from foul line to pin deck or sixty-three feet to the pit. A bowler attempts to keep his ball out of the rounded areas bordering each side of the alley-bed, the gutters. Alleys are forty-two inches wide with nine inch gutters, or forty-one inches wide with nine-and-a-half inch gutters. The alley bed is made of carefully matched hard maple (light colored boards) and pine (darker colored boards) laid on edge. Thus, the balls are rolled on the three inch thickness of the boards, not on their one inch widths. This prevents the slightest give in the alley surface. Hard maple is used on the first third of the lane and on the section supporting the pins which is called the pin deck. These two areas absorb thousands of punishing blows from ball deliveries and falling pins.

A bowling lane is leveled so that no area on its surface is more than forty thousandths of an inch higher or lower than any other section. Kickbacks enclose the two sides of the pit and pin deck. They are two and three quarter inches thick with standard fifteen by fifty inch fiber kickback plates attached and provide a resilient, rebounding area for the pins. The pit is located directly behind the pins. It is the area in which the pin setter works and into which pins and balls fall. The pit is nine and a half inches below the alley bed and is no less than thirty inches deep from rear cushion to alley edge. The rear cushion must be covered with a dark colored material and constructed so as to prevent pins from rebounding onto the pin deck. Every proprietor of an American Bowling Congress (ABC) sanctioned alley must completely resurface his lanes at least once every two years. Markings on approach and alley surfaces are permitted if they are flush with the alley and meet ABC specifications as to number and distance from the foul line. The tracklike divider separating each pair of alleys is called the ball return and provides an efficient method of sending the ball from the pin setter to the bowler. Some ball returns are now below the level of the alley bed.

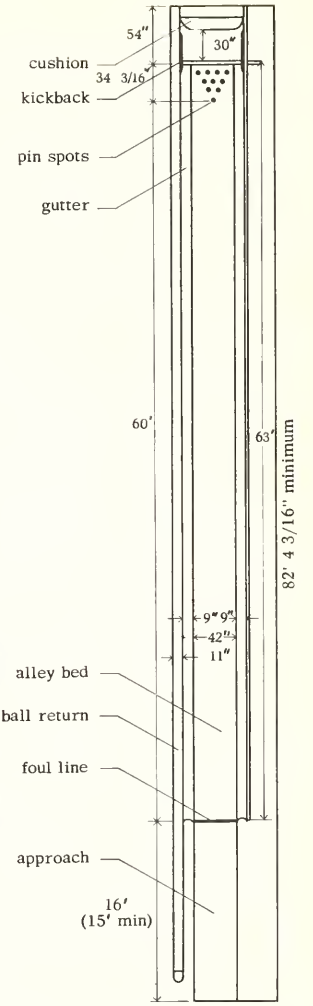
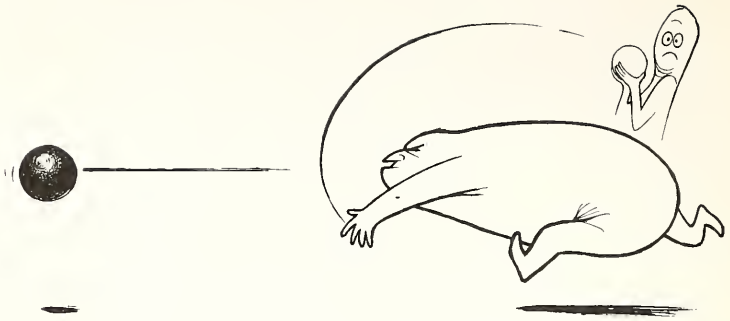


Figure 10. Alley parts and dimensions.

chapter 4

Delivery



The aim of bowling is to knock down all ten pins in the fewest deliveries possible; therefore, any way by which this purpose is accomplished consistently would undoubtedly be considered acceptable form. Granted, there is no such thing in bowling as perfect form that can be expected from all participants; there is, however, a fundamental form accepted by most experts as a starting point for the average beginner. Once these basic fundamentals have been mastered, such individual differences as height, weight, strength, coordination and physical defects require only slight adjustments to develop a smooth, rhythmical, natural delivery.

When outstanding bowlers are observed, it will be noted that, although each may have a different style, there are many similarities. Every beginning bowler should start with these similarities, called basic bowling skills. As he continues to advance and improve, the beginner will gradually develop his own style -- the one that is most natural for him.

If he is short, the bowler may take an upright stance closer to the foul line. If he is tall, he may bend slightly forward and stand farther from the foul line. A person will learn, through practice and guidance, the style most natural for him.

All beginners should do some practicing at home, perfecting basic skills and developing confidence. Some fairly heavy object, like an electric iron, should be held to simulate the bowling ball; this necessitates the use of the free arm and leg as a natural counterbalance. Incorrect practice, however, perfects faults; therefore, it is extremely important to practice correctly until good form becomes so natural that it requires little thought.

Since many people are visual-minded, a demonstration of proper bowling form provides a complete picture of what the students are attempting to achieve. As the instructor makes several deliveries, he calls attention to various fundamentals. These skills should then be practiced individually before attempting to combine them in a complete synchronized movement.

A bowler may take three, four, or five steps in making his approach. Since the ball is delivered with the entire body, not just the arm, he must select the approach which most effectively results in the ball and left foot arriving at the foul line simultaneously. With expert help, much practice, and a great deal of concentration, the bowler can accomplish this end by using any one of the three main styles. Due to its simplicity, however, the four-step approach is the most accepted. It is recommended by many experts as the style to be taught to the beginner because of the ease of coordinating arm and leg movements. For this reason, the four-step approach is presented here in detail, while the three- and five-step approaches are discussed only briefly.

Four-step Delivery -- Footwork

In order to become proficient in bowling, a person must be able to do exactly the same thing in the same way with every delivery. He must be consistent in everything he does; therefore, he first selects and memorizes an exact starting point on which he takes his stance. This point is

located to the right of the center of the alley, approximately four steps from the foul line (twelve to fifteen feet). Slight adjustments may be needed in individual cases. If alleys are equipped with "range finders," a right-handed bowler takes his stance with the left foot on the same board as the first dot to the right of center. (Figure 11.) As the student gains experience, individual variations may be made, but a beginner needs a definite spot from which to start. After the fundamental footwork has been presented, the novice may determine the exact distance of his starting spot from the foul line by making his approach in reverse, i.e., from the foul line toward the benches.

Figure 11. Starting position in relation to range finder dots on the approach.

Group Drill

Before attempting to teach the combined, coordinated movements of the approach, the instructor will save a great deal of time by having the students, in unison, practice footwork only. Further harmony of movement will be noticed in working with large groups if the students will hold hands while practicing footwork. (Figures 12 and 13.) This serves two main purposes: (1) it allows the instructor to discover a deviation of one or more individuals in discord with the majority. The rhythmical movement of the group will be upset if one or two students start on the wrong foot, hesitate after each step or take little or no slide. (2) it forces the uncoordinated individual into correct footwork by having a well-coordinated person on either side. For example, it is difficult for one person to stand erect on the fourth step (the glide) if the remainder of the group is sinking over the left knee in a smooth, coordinated slide. It is sometimes easier to conform to these movements than to resist when the group practices with clasped hands. In a drill of this type, it is advisable to have all left-handed bowlers practice separately.

Figure 12. Group drill -- starting position.

Figure 13. Group drill -- end of slide.

During this practice on footwork, right-handed students are instructed to stand with the left foot slightly forward. (Figure 14.) The weight is comfortably distributed over both feet and slightly back over the heels. Beginners must remember to walk straight to the foul line, avoiding any zigzag or hopping motion. If the instructor counts with a rhythmical beat, it helps set the tempo for the class. On count one, each student takes a short, initial step, (more of a half step), with the right foot. Count two is a stride forward with the left foot, taken in the same tempo but a trifle longer than step one. Momentum is gathered with each step, thus count three results in a longer, faster step on the right foot. Count four is the longest stride in the approach but is not actually a step; it is a long, smooth slide, or glide, forward on the left foot. If the novice will practice starting the slide by skimming the approach with the sole of the left foot as it passes the right, he will find that the shift of weight from right to left is more gradual, resulting in a smooth glide. The student should have the sensation of sinking over a "soft" left knee while keeping the trunk fairly erect. This action allows the left foot to continue a natural slide until the weight is gradually shifted to the rubber heel of the left shoe. In this way, the heel acts as a slow brake terminating the slide smoothly as the right leg swings slightly to the left acting as a balance and assisting in the braking action.

Figure 14. Feet in starting position.

As the novice practices his footwork, he should repeat rhythmically to himself "one-two-three-four," "right-left-right-slide" or "right-left-right-sink." This is, of course, reversed for left handers. When a group practices in unison or by holding hands, as previously described, the

instructor calls or claps the rhythm. During this group practice the instructor observes the students from the front, giving individual assistance where needed. After all students have practiced footwork, the coordinated arm movements are added. Pupils from each alley form a file and are assigned numbers (one, two, three, etc.) to facilitate the time-consuming process of drills. As the instructor calls a number, each student having that number steps to the approach and prepares to practice this four-step footwork. After his turn, the student moves to the end of the file.

Approach and Release

With feet correctly placed on the designated starting spot, each student takes the following position: hips and shoulders squarely facing the pins; shoulders level; knees slightly bent; body relaxed and balanced; both elbows close to the body; forearms parallel to the floor and almost in line with the hips; back of right hand level with wrist, parallel to the floor, and touching or resting in upturned left hand; right thumb pointing at pin five through the V formed by the middle and ring fingers, and eyes fixed on a point of aim. (Figure 15.)

Figure 15. Stance.

Synchronizing the arms with the footwork is a difficult task for the majority of beginners. When the weight of a twelve to sixteen pound ball is added, this coordination becomes even more complex. Sometimes beginners visualize the movements more readily if, without a ball, they take the steps slowly, even stopping or hesitating with each step until they get the feel of the complete coordinated rhythm. The instructor can talk the students through each motion, then progress on to the next phase much more easily without the handicap of a heavy ball.

On the first count, the students should push the imaginary ball forward (pushaway) with both hands as if handing it to someone. As the pushaway starts, the bowler steps forward with his right foot so that the foot touches the floor as the right arm reaches the straight elbow position. (Figure 16.) On count two, the left hand leaves the imaginary ball as the ball starts its backswing. From here on, the left hand is used to assist in maintaining balance by its continued sideward and backward motion. The left foot steps forward as the right arm swings downward and straight backward in a pendulum swing. (Figure 17.) As the right foot strides forward on count three, the body is inclined forward to compensate for the weight of the ball and the right arm continues its backswing, passing the right leg near the bottom of the pendulum arc. At the end of the third step, the right arm has reached the height of the backswing as the body continues its smooth forward motion. The swing reaches its backward peak naturally at about shoulder level or lower. (Figure 18.) On count four, as the left foot starts forward into the slide, both knees bend and the straight right arm swings smoothly downward and forward. Thus, the right arm and left foot move forward together. The ~~imaginary~~ ball passes close to the left ankle and is released on the start of the upswing, approximately one foot beyond the foul line and eight to ten boards in from the right hand gutter. (Figure 19.) Pressure is felt on the front of the fingers from the bottom of the swing until the ball is released. If this slight lift is not applied preceding the release, the ball may be dropped too soon, usually near the bottom of the swing. Too much lift, on the other hand, may result in lofting the ball ten to fifteen feet down the alley. In either event, the ball lands on the approach or alley surface with a loud, undesirable thud.

Figure 16. Group drill -- step one.

Figure 17. Group drill -- step two.

Figure 18. Group drill -- step three.

Figure 19. Group drill -- step four (slide).

Use of Right Leg as a Counterbalance.

Many bowlers are troubled by improper use of the free right foot. It is correct for the right toe to stay on the alley in the push off position or to swing to the left to aid in maintaining overall balance. The right leg should not be allowed to swing so far to the left, however, that it forces the left foot to turn away from the ideal position, parallel to the boards of the approach. If the left foot is permitted to turn to the right, this motion is transferred through the body until the shoulders are affected. Usually the shoulders are found turning in the same direction as the erroneous position of the left foot. An erratic delivery is likely to follow. Swinging freedom is permitted in using the right leg as a balance and braking anchor as long as it does not draw the left foot and the shoulders from their aforementioned ideal delivery positions. (Figure 20.)

Follow-through

A complete follow-through is essential in good bowling form and is accomplished by reaching through the point of aim. This reaching action starts the ball rolling as soon as it leaves the hand and serves as a guide in directing the ball to its target.

To prevent beginners from rolling the ball too far across the alley, the instructor demonstrates that the right arm follows the ball through the target until the hand stops between this point of aim and right eye. To emphasize the reach during the follow-through, a bright ribbon can be hung about chest high, approximately five feet beyond the foul line and in line with the normal follow-through position and the one-three pocket. Attempting to touch this ribbon after delivering the ball may assist some students to develop a more complete follow-through. During the delivery and follow-through, the body leans slightly forward, as the right thumb reaches directly toward the five pin. The left foot stops two to six inches behind the foul line, parallel to the boards and on the same board from which the approach originated. Many errors can be diagnosed by the individual bowler if he will take the trouble to study his follow-through. Throughout the entire delivery, shoulders remain parallel to the foul line and the right arm parallels the floor boards.

Figure 20. Release.

Removing Ball from Return Rack

As one student from each alley goes through this mimetic approach, the instructor counts in rhythm, "right, left, right, slide" (sink), or, if there are left-handed students in the group, he counts "one, two, three, slide." After everyone has had several turns practicing the approach without a ball, a demonstration of the correct way to remove a ball from the return rack is given. The bowler, while facing the pins, places one hand on each side of the ball and lifts it with both hands. (Figure 21.) A common error is that of placing the bowling fingers in the ball to lift it from the rack. This causes undue strain on these fingers and results in tired hand muscles and loss of control. The bowler returns to an upright position, shifting the ball to the left hand, and holding it against the waist until the stance is taken. (Figure 22.) In this way the thumb and fingers of the bowling hand are relaxed and dry when ready to insert them into the ball. The bowler is now more nearly assured of a comfortable grip, free from strain.

At first, beginners should "shadow bowl," i.e., roll a ball without any pins set up. This allows each individual an opportunity to work on form without having to concentrate on hitting pins. It also affords the pin setter a chance to gauge the speed of balls of various bowlers without the confusion of actually setting pins.

Figure 21. Lifting ball from return rack.

Figure 22. Preparing to take stance.

Target for Beginners

After rolling several "shadow balls," the student will find that the approach begins to feel a little more natural. He is now given a definite target. Some bowling instructors start students rolling at all ten pins immediately. If this is done, many beginners become so concerned with trying to hit the pins that they completely forget form. For this reason, it is recommended that only a few pins be used as a beginning target. This is not only a help to the bowler but also to the beginning pin setter. The one, three, and five pins (one, two, five for left handers) form a good starting target, because these are the key pins in delivering a strike ball. (Figure 23.) Some instructors start with the five pin alone as the initial target. In either case, it is explained that the ball rolls on a straight, diagonal line from the point of release directly toward the number five pin. If the one-three pins are standing, a straight ball must hit the one pin a little heavy in order to carry the five pin. Generally, it can be stated that a straight ball should hit the right half of pin number one and the left third of the number three pin as it goes through the one-three pocket.

Rolling the ball at all ten pins is introduced later when the instructor feels that the majority of students shows reasonably good form. Even so, they continue practicing only the strike ball delivery, as spare bowling has yet to be presented. Pin setters are gaining in experience as each new phase of the game is added.

Figure 23. Strike ball target.

Figure 24. Removing ball from return rack.

Figure 25. Awaiting turn.

Figure 28. Step two -- start of backswing.

Figure 29. Step two -- continued.

Figure 26. Addressing pins.

Figure 27. Pushaway and step one.

Figure 30. Step three -- peak of backswing.

Figure 31. Step four -- slide and release.

Use of One-step Approach

Occasionally a student finds it difficult to coordinate footwork and arm swing in early attempts at rolling a bowling ball. If given immediate, individual help, these people may be saved from permanent difficulties. If they are instructed to try a one-step delivery until it feels natural, they may then add each preceding step until the desired four-step synchronization is attained.

Standing with both feet together, about four feet from the foul line, the student starts the one-step delivery with a pushaway. The ball swings as a pendulum near the right leg. After the ball has reached the peak of the backswing and is just starting forward, both knees bend. A push off with the right foot sends the bowler forward into a graceful slide on the left foot, while the ball continues forward through the release and follow-through.

This same one-step procedure may also be useful in helping students who have difficulty with the fourth step (slide) in any approach. It simplifies the push off, the "soft" knee, and the rhythmical slide without the necessity of concentrating on the complete coordinated approach.

Analyzing Faults

As the novice improves in skill, he becomes increasingly aware of the necessity of analyzing and correcting his faults. At first, it is essential to have a trained instructor observe and assist in correcting errors, but these observations are needed less frequently as the bowler becomes more proficient. The experienced bowler generally realizes that periodic scrutiny by an expert will prevent many future difficulties. He is cognizant that a trained eye will readily see the slight imperfections in form that may soon lead to major faults. A bowler may not be aware of these errors in his own delivery because they develop so gradually that flaws begin to feel normal.

Each person should attempt to minimize the element of chance early in his bowling experience. For example, he may be presented with a few of the more important factors influencing bowling form and shown how these may be checked in a regular order to aid in analyzing his own personal faults. Assuming that the bowler is consistent in taking his stance, he makes his approach and releases the ball. After the delivery, if a balanced follow-through position can be held until the ball falls into the pit, the bowler can check these points: (Figure 32.)

1. Did the ball hit the point of aim (5 pin through the 1-3 pocket)? If not, how far to the right or left did it miss?
2. Is the follow-through directly toward the point of aim?
3. Is the left foot on the same board on which it started and still parallel to the floor boards?
4. Was the action of the ball normal?

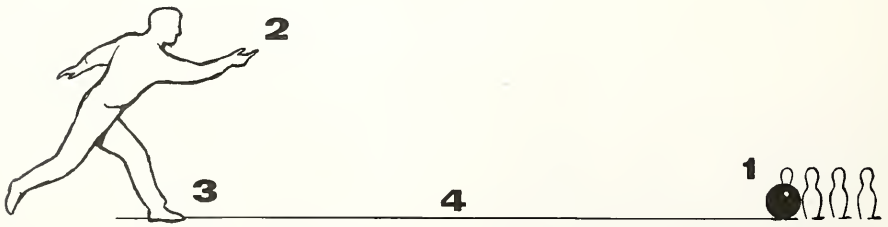


Figure 32. Check points for pin bowlers.

After these points have been checked, necessary corrections are planned. Considerable practice is required to make this a routine procedure, but once it has been established, improvement should follow. When a bowler is off his normal form, he may tend to roll a faster ball in the erroneous belief that speed will correct his difficulty, but speed is seldom the remedy. If the student can remember to ease up and return to the above check points, it may be possible to make minor adjustments instead of major changes in his delivery.

If a large mirror can be placed or hung across one alley, beginners and experienced bowlers will profit by a periodic visual observation of their own form. When the sense of feel is supplemented by the sense of sight, this lingering, visual image may thwart the development of a flaw in unsupervised practice. Again, advanced bowlers must remember that a defect is easily seen but is difficult to feel.

Conscientious bowlers will attempt to embrace every element of good bowling form, namely: a comfortable stance, four well-timed steps, a synchronized swing, a smooth slide, a rhythmical delivery, and a complete follow-through. From this point on, bowling is an individual game. Because of differences in body build the delivery of each bowler will vary but all should use the basics of good form.

Other Approaches

Instructors are sometimes confronted in class situations by students who have had previous bowling experience. Often the approach used by these people consists of four steps. Frequently, however, a beginner gets his start from a well-meaning friend or by observing other bowlers. Unfortunately, this type of learning may result in a three-step approach which immediately presents an instructional problem. Should the student be required to change to a four-step approach, or will he be allowed to continue with the style he has started? This decision should be given much thought and consideration by both student and instructor. If it is decided that the bowler will attempt to change to the four-step approach, he will be taught the basic fundamentals with the rest of the class. If his high average warrants continuance of the unorthodox form, or if, as occasionally appears, a novice is unable to use the four or five-step approach successfully, special consideration must be given to the three-stepper.

Three-step Delivery

Experts strongly advise against the three-step approach because it requires more muscular strength than four- or five-step deliveries. Due to the shorter distance to the foul line, a bowler uses more arm and hand muscles in making this delivery. In the longer approaches, the body builds momentum with each added step, thereby decreasing strain on the arm. Generally speaking, the three-step approach is jerky. If the ball is pushed away as the first step is taken, the three-stepper completely finishes his slide while the ball is still at the top of the backswing. Such action necessitates a forced delivery; consequently frequent errors occur. In attempting to develop a smooth and effective three-step approach, the bowler should step left, right, left. Coordinating arms and legs requires more thought than the four-step approach, if the release is to be perfectly timed with the slide.

The most rhythmic three-step approach starts with the pushaway without stepping forward. Not until the ball starts its backswing is the first step taken with the left foot. From this point on, the synchronized movements are similar to the second, third and fourth steps of the four-step delivery.

Five-step Delivery

A five-step approach is the four-step delivery with one extra stride to give additional speed. Keglers attempting the five-step approach start their forward motion by taking a short step with the left foot. As the right foot comes forward for the second step, the ball is pushed away and from here on four-step timing is used. An approach using five steps is preferred to three steps for students who choose to start on the right foot. The five-step approach combines speed and smoothness by the use of shorter steps and results in a well-coordinated delivery.

Velocity of Ball

Contrary to the belief of many keglers, a bowling ball may be rolled with too little speed or thrown with too much speed. Girls who propel the ball gently down the alley and boys who attempt to split the pins with each delivery are deprived of many strikes by balls that appear to be good hits. The number of pins toppled is neither directly proportional to, nor inversely proportional to, the speed of the ball, but velocity is extremely important. Deflection of the ball as it hits the pins is directly proportional to the speed and weight of the ball. Therefore, the girl who rolls a very slow ball is doubly handicapped because she is also probably using a light weight ball. Conversely, the boy who rolls a maximum weight ball with a high speed delivery is using neither to its greatest advantage.

Bowling pins are spaced one foot apart from center to center and are spotted so that the ten pins form an equilateral triangle, with the apex toward the bowler. This triangular spacing means that the impact of a ball in the 1-3 pocket should be at a speed which enables pins to fall away from the ball at approximately a forty-five degree angle. An exceptionally slow delivery permits more than normal ball deflection and allows pins to topple away at a greater angle. A "cannon ball," on the other hand, does not permit normal ball deflection and the angle at which contacted pins leave the ball is less than forty-five degrees. Excessive speed also tends to lift pins vertically from the pin deck forcing them between standing pins without making contact. (Figure 33.) All of these errors increase the possibility of leaving pins standing, and generally the bowler finishes his delivery in a poorly balanced, follow-through position.

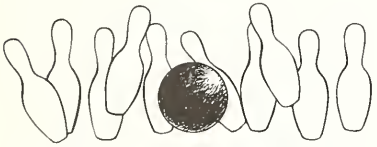


Figure 33. Pin deflection resulting from fast ball delivery.

Medium Speed Ball

Bowlers should strive to attain a medium speed ball, that is, a speed that is natural and can be sustained for long periods of time without undue fatigue. A medium speed ball "works" more effectively because the deflection of the ball and the angle of the pins leaving it are best for optimum results. There is a tendency for the first pins contacted to fall onto their sides. When these pins hit other pins, they begin spinning. With spinning pins moving into those still standing, a "mixing" action results that sweeps the remaining pins from the deck into the pit. (Figure 34.)

Slow Ball

Inadequate speed on a ball may result from hesitating after each step, a short approach, a short backswing, resisting the arm swing, or poor coordination. Anyone having this trouble needs special help until the fault is corrected. Generally a faster approach will transfer speed to the ball. Lengthening the approach and giving a more forceful, slightly downward pushaway on count one sometimes corrects this fault quickly. The ball reaches the peak of the backswing sooner, forcing a more rapid movement of the feet.

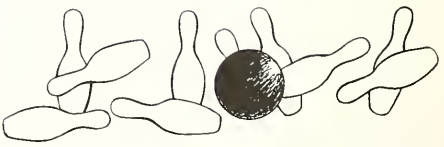


Figure 34. Pin action resulting from medium speed ball.

Fast Ball

Too much speed on the ball may be caused by holding it too high during the stance; lifting the ball in the pushaway; lifting the ball on the backswing; forcing the ball in the forward swing; taking a long approach; beating the ball to the foul line; or throwing, instead of rolling, the ball. Sometimes a "speed-baller" can be corrected by reducing the speed of his approach, starting closer to the foul line, or decreasing the height of his pushaway and/or his backswing.

A bowler who shoots the ball down the lane with such excessive speed that his timing is upset and he falls off balance is not using a normal delivery and his accuracy will be impaired.

Bowling is a sport requiring more skill than brawn. Thus, correct velocity is attained and controlled by a natural, well-timed, rhythmical approach, delivery and follow-through.

chapter 5

Introduction to Leaves

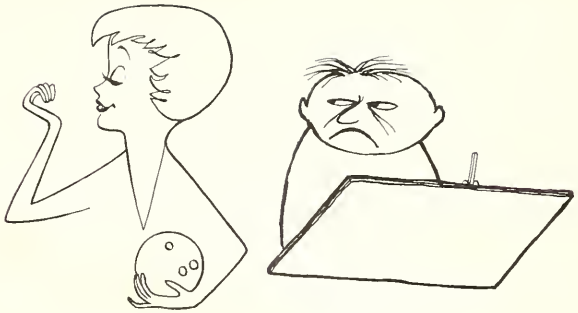
A more complete discussion of leaves will be presented later with diagrams of how they should be converted. So far, in a class situation, the students have practiced only the strike ball delivery by aiming at the five pin through the one-three pocket. Now the emphasis should be changed from strike ball deliveries to those that will convert leaves into spares. Stress on converting spares is one of the most important phases of the game scorewise, as bowlers who pick up only spares can, in a single game, roll a 190 score. There are times when a bowler is unable to beg, borrow, or steal a strike in a particular game; but, if he converts his leaves, he will have a respectable score. Then, when strikes do come, the bowler will finish with an extremely high score.

At this early stage of bowling, the student is unable to distinguish between many complicated aspects of the game. Therefore, he is given a demonstration of the general rule for picking up leaves, with an explanation that there are exceptions which will be presented later. The rule of opposition, or the cross alley theory, for converting leaves to spares states that, if more pins are left standing on the left side of the alley, the bowler takes his stance to the right of center, and conversely, if more pins are left standing on the right, the bowler takes his stance to the left of center. This is the percentage system of bowling whereby the bowler takes advantage of increasing the angle between the point of release and the pins. This results in the ball rolling into and contacting the greatest number of pins. Flying pins cannot be counted upon to do the same thing every time due to the difference in deflection from hitting other pins at various angles. Even though the ball is diverted as it contacts the pins, because of its weight and shape, the deviation is slight compared to that of the lighter, oddly shaped pins.

In keeping with the theory that each progressive step should be kept as simple as possible to decrease confusion, beginners should be given an exact starting area on each side of the approach. The position of the stance for the strike ball delivery is familiar by this time, so the same starting point is used for rolling at leaves on the left side of the pin deck. This places the student with his left foot approximately six inches (boards) to the right of the center of the approach. This stance is reversed for rolling at leaves on the right of the pin deck. The right foot is placed about six inches to the left of the center of the approach. In this way the student is able to remember that each time he takes his stance, the foot nearer the middle of the approach will be the same distance from the center on every shot he takes. Advanced bowlers may feel that this stance is not far enough to the left or right to give them the angle and amount of alley they need to roll at the corner pins. This stance is presented for its simplicity and because, under certain conditions, the bowler is not as likely to kick the ball return with his balance foot. Kicking the ball return sometimes results in an unnatural shoulder position, as the kick is relayed through the body; also, it may cause a momentary loss of concentration. In either case, it tends to cause a physical or mental error. Careful aim must be taken and each leave approached with confidence.

chapter 6

Scoring



Several methods of explaining scoring may be employed effectively. If material can be mimeographed for distribution to each student, a sample game may be set up and explained, ball by ball and frame by frame. If this method is not possible, telescores can be used with the procedure suggested above. (Figure 35.) If the alleys are not equipped with telescores, a large blackboard is satisfactory for a detailed description. Free booklets, obtainable at most alleys, are an excellent supplement to any of the above methods.

Figure 35. Use of Tel-E-Score for teaching scoring.

Scoring Symbols

In any explanation the following terms should be emphasized and made clear:

strike -- all ten pins knocked down with the first ball of a frame.

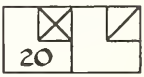
spare -- all ten pins knocked down with two balls in the same frame.

blow (error or miss) -- failure to convert to a spare any leave other than a split.

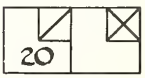
split (railroad) -- a leave in which the head pin is down and one or more spaces remain between or in front of standing pins.

split converted into a spare

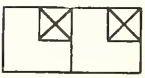
strike followed by a spare -- scores 20.



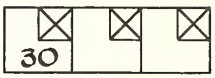
spare followed by a strike -- scores 20.



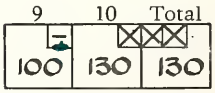
double -- two strikes in succession.



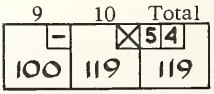
turkey -- three successive strikes -- scores 30.

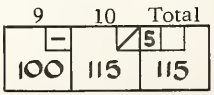


strike out -- a strike in the tenth frame followed by a strike with each of the two extra (bonus) balls.



mark in the tenth frame -- strike or spare in tenth frame.





foul -- any part of the body crossing and touching the alley beyond the foul line.

cherry (chop) -- to knock down, with the second ball of a frame, only the front pin or pins of a leave.

gutter ball -- first ball of a frame that rolls into either gutter without knocking down any pins.

gutter ball followed by a strike ball -- spare.

game, line or string -- ten frames.

1	2	3	4	5	6	7	8	9	10	Total

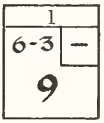
Scoring is cumulative, i.e., to the total of each frame is added the sum of the pins knocked down in the next frame plus strike or spare bonuses, if any.

Two balls are allowed, if necessary, in each frame, but only one ball is rolled if the bowler scores a strike.

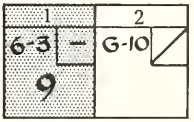
In a class situation it is advisable to have students indicate the number of pins scored by each ball (see examples). Otherwise, it is impossible for the instructor to check the accuracy of the score sheets.

Sample Game

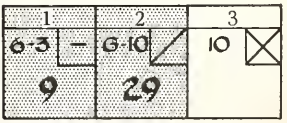
Frame 1: Bowler Tim Smith, with his first ball, knocks down six pins, and with his second ball picks up three of the remaining four pins.



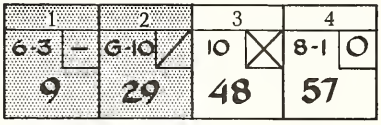
Frame 2: Tim gutters his first ball but knocks down all ten pins with his second ball. He has scored a spare but nothing more is added until after he rolls his next ball (i.e.,: first ball of third frame).



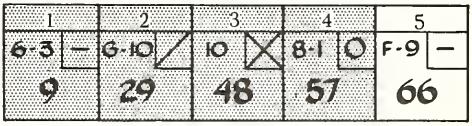
Frame 3: With the next ball he rolls a strike. In the second frame, he now has ten for his spare plus a bonus of the pins knocked down by his next ball, in this case, ten. Twenty is added to the score of nine from frame one giving him twenty-nine in the second frame. No score is written in the third frame until two more balls have been rolled.



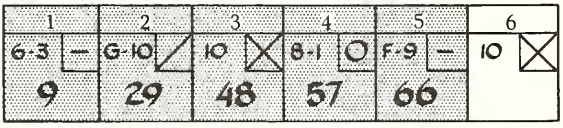
Frame 4: After his first ball, Tim leaves the 3-10 babysplit standing and with his second ball picks only one more pin. A bonus of 8 + 1 (9) is added to the 10 of frame three's strike. Thus, 19 is added to the 29 of frame 2 to make a score of 48 in the third frame. The total of frame 4, which is 9 is then added to the 48 and Tim has 57 in the fourth.



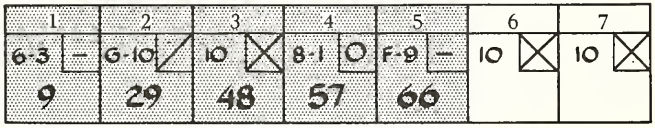
Frame 5: With his first ball Tim Smith knocks down all ten pins but commits a foul. His strike is nullified and he rolls his second ball at all ten pins which have been respotted. With this second ball he topples nine pins. His score of nine pins for frame five is added to the 57 of frame four. (If on his second ball he had knocked down all ten pins, he would have scored a spare.)



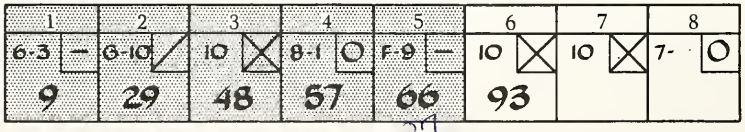
Frame 6: Tim rolls a strike. This is indicated by an X on the score sheet but no score is recorded. He now has 10 pins to his credit.



Frame 7: Another strike. This is a double (two strikes in a row) and is one of the stumbling blocks of scoring because the score that will be entered in frame six depends on the number of pins scored with the first ball of frame eight. No score is written in either frame six or seven, but now he actually has 20 pins to his credit.



Frame 8: Tim leaves the 4-5-7 split; so the 7 pins of this first ball are now added to the 20 of his two strikes. Thus, 27 is added to the 66 of frame five and the sum (93) is entered in frame six. This applies the strike rule: 10 for a strike plus a bonus of the total



pins knocked down by the next two balls. With his second ball of the eighth frame, Tim knocks down the remaining 3 pins, converting the split to a spare: To calculate his score for frame seven Tim now adds the spare of frame eight to the strike of frame seven to the 93 of frame six for a total of 113.

1	2	3	4	5	6	7	8
6-3 –	6-10 /	10 X	8-1 O	F-9 –	10 X	10 X	7-3 Ø
9	29	48	57	66	93	113	

Frame 9: Tim gets only 5 pins with his first ball. With his second ball he knocks down two of the remaining five pins but commits a foul. These two pins do not count. A score of five is added to the 128 of the eighth frame, giving him 133 in the ninth frame.

1	2	3	4	5	6	7	8	9
6-3 –	6-10 /	10 X	8-1 O	F-9 –	10 X	10 X	7-3 Ø	5-F –
9	29	48	57	66	93	113	128	133

Since a mark (spare or strike) in the tenth frame entitles the bowler to one or two bonus balls, four different tenth frame situations follow. The preceding game through the ninth frame is used in every case.

Frame 10: Tim blows, getting 5 pins with his first ball and none with his second: 133 + 5 = 138.

9	10	Total
5-F –	5-0 –	
133	138	138

Frame 10-A: Tim gets a spare and, with his one bonus ball, (which he takes immediately), gets a strike: 133 + 20 = 153.

9	10	Total
5-F –	6-4 / 10	
133	153	153

Frame 10-B: He rolls a strike and with his two bonus balls (taken immediately), makes a spare: 133 + 20 = 153.

9	10	Total
5-F –	10 X 8 2	
133	153	153

Note: Since a strike followed by a spare and a spare followed by strike each totals 20 pins, games A and B end with identical scores.

Frame 10-C: Following a strike in the tenth frame, Tim rolls another strike (doubles), and picks up 5 pins with his second (and last) bonus ball: 133 + 25 = 158.

9	10	Total
5-F –	10 X 10 X 5	
133	158	158

Frame 10-D: Tim strikes out (contrary to baseball, bowlers want to strike out). This adds 30 pins, the maximum for any one frame, to his ninth frame score: 133 + 30 = 163.

9	10	Total
5-F –	10	
133	163	163

Some scorekeepers record the bonus balls in the tenth frame as shown to the right.

9	10	Total
5-F –		
133	163	163

Some bowlers like to "black-in" spares and strikes. This method is not accepted in league or tournament play.

9	10	Total
5-F –	10	
133	153	153

In league play, scoring is identical with the sample given. Three items which make it appear different are: 1. marks for team members are added together for each frame. (Doubles and turkeys count as two marks); this shows within a few pins which team is ahead; 2. the handicap, if any, is added to the lead-off bowler's score; 3. team members' scores are added together. (Figure 36.)

	Name	1	2	10	Total
				–	+11 ← HANDICAP
1	ANDY	8		145	156
2	BRUCE	27		190	346
3	CHUCK	7	16	150	496
4	DICK	19	28	140	636
5	ED	20		185	821
6	HDCP. 1 MARK	4	8		WINNERS
		CUMULATIVE MARKS			

Figure 36. Team score sheet.

chapter 7

Etiquette

Each of us demonstrates a knowledge of or a deficiency in etiquette wherever he is in society. Sports have their own peculiar rules and customs, and bowling is no exception. Experts become so accustomed to abiding by these rules that they frequently show a lack of patience with the uninformed novice. To save himself from embarrassment, it behooves the beginner to study the basic rules of etiquette before attempting a sport. Unfortunately the inexperienced participant rarely knows where to find these rules and, if he did, he would probably be unaware of their significance. To illustrate the importance of etiquette, a hypothetical situation is presented involving four beginners surrounded by a group of experienced bowlers.

Problems of Beginners

Suzie, Skip, Liz, and Rod enter a bowling alley for an evening's entertainment. It is their first attempt at bowling and enthusiasm is high. Noticing that all the alleys are filled, they use good judgment in approaching the desk to request an alley. The attendant suggests that they be seated and calls them when an alley is available. He gives them a score sheet and assigns them to Alley Eight. As the prospective bowlers turn to leave the desk, the attendant asks if they have bowling shoes. Since they do not, he explains that the alley has shoes to rent and everyone is required to wear them when bowling. He points out that street shoes would carry grit, grime, or moisture, from outside that would affect not only the bowler wearing the shoes but also those who follow him. As the group leaves the desk, they stop to leave coats and parcels at an area provided by the management. Even as beginners they are aware that it would be poor etiquette to deprive spectators of a place to relax by leaving wraps in the seats behind the alleys.

Fortunately the quartet passes several storage racks of balls on the way to their alley. Everyone except Skip finds a ball to his liking on the racks. Because he lacks knowledge of etiquette, Skip starts investigating the ball return racks on the alleys, walking from one approach to another without regard for the bowlers. Finally, after receiving dagger glares from several people, he picks up a ball and walks away. To his amazement, he is immediately apprehended by a man who says he is leaving with his private ball. The man shows Skip his initials on the ball and explains that in searching for a ball, it is good etiquette to inconvenience the bowlers as little as possible. The new arrival should make his selection quickly and ask if anyone is using that ball before removing it from the return rack. He is then shown how to identify a ball by its number. Skip thanks the man for his patience and proceeds to make his selection correctly.

During the game, Liz decides to change to another ball. When she finds the one of her choice, she places it on the already crowded ball return. Almost immediately a neighboring bowler asks her to remove the ball she is no longer using. At the same time the group is told to return all balls to the storage racks when they finish their game.

As the game progresses, Rod bends over to lift his ball from the return just as the man to his left starts his approach. The man stops and returns to wait for Rod to bowl. Rod motions

him on but then proceeds to race the man to the foul line. As Rod's ball nears the pins, he jumps to his right using "body English" to try to help the ball into the one-three pocket. This unnecessary gyration forced the lady on his right to make a poor delivery in an attempt to avoid hitting Rod with her ball. Rod leaves the three and nine pins standing and steps into the adjacent approach in order to see the nine pin "sleeper." All of these maneuvers are disturbing to other people and are not tolerated by experienced bowlers.

Suzie has had the feeling that the approach was slippery. She decides to try chalk on her shoes as a solution to this problem. The chalk works, only too well, so that Suzie's foot now sticks to the approach. To correct this, she puts powder on her shoes thus ruining the approach for everyone because now it is sticky in spots and slippery in other areas.

By this time the manager has had complaints from several sources regarding the foursome. As he starts toward them to explain the rules of etiquette, he sees Liz roll her second ball without waiting for her first to be returned. The pin setter was still in the pit and would have been hit had the manager not called out so that he quickly jumped to safety.

Specific Cues

The manager, realizing the plight of beginners, sat down and explained the basic rules of etiquette to the group. These rules are devised not to detract from the game in any way but to add to it by consideration for the safety, convenience, and mental attitude of others.

Do's for Proper Bowling

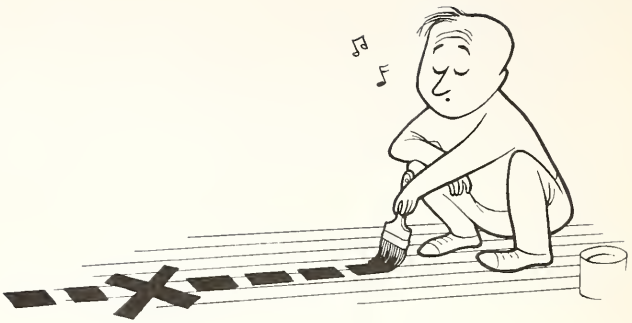
1. Request an alley at the desk.
2. Wait your turn for alley assignment.
3. Place coats and parcels in area provided.
4. Wear bowling shoes.
5. Select ball from storage racks.
6. If necessary to select ball from return racks, move quickly so as to inconvenience others as little as possible.
7. Check with all bowlers before removing ball from return rack.
8. Remove from return rack all balls not in use.
9. At end of game return balls to storage rack.
10. Learn to identify your ball.
11. Be ready to bowl when it is your turn.
12. Stay behind the line of vision of a bowler preparing to bowl on either side of your approach until his delivery is completed.
13. When two people on adjacent alleys are ready to bowl at the same time, the person on the right goes first.
14. Once he has taken his stance do not disturb a bowler.
15. Stand back off the approach while waiting for your ball to be returned.
16. Do not address the pins until all deadwood has been removed and the pin setter is out of the pit.
17. Use the same ball for first and second deliveries.
18. Do not loft the ball.
19. Stay in your own approach before, during, and after all deliveries.
20. Know the pins by their numbers.

21. Report sticky or slick approach conditions to the manager.
22. Do not gripe.
23. Always show consideration for others.
24. Work for a high "etiquette average."

After the short lesson in etiquette, Liz, Suzie, Skip, and Rod enjoyed the game much more, because they were not interfering with other bowlers and they were aware of how considerate others were of them. They left the bowling lanes with high hopes of returning soon.

chapter 8

Spot Bowling



Instead of rolling the ball directly at the pins, many bowlers choose to aim at a spot somewhere between the foul line and midway to the pins. This is called spot bowling and is based on the theory that a spot or target near the foul line is easier to hit than one sixty feet away. All bowlers do not use the same point of aim. Many experts locate their spots near the foul line by counting a definite number of boards in from the gutter; some like a spot eight or nine boards from the edge of the alley; others prefer a point ten or twelve boards in from the edge.

Strike Ball

Most spot bowlers choose to aim at a spot part way down the alley and refrain from looking at the pins until after the ball has passed this point. If the chosen spot is near the foul line, the ball is put down directly on that spot every time; if a spot farther out on the alley is used, the bowler attempts to have the first ball of every frame roll directly over that spot. To determine his spot, the bowler stands at the foul line where he plans to release his ball and sights an imaginary line from the pin or pins at which he is aiming to his right foot.

A spot bowler may be compared to a golfer who keeps his head stationary and his eyes concentrated on the ball throughout the swing, in order to maintain a center of balance and to keep from throwing his stroke out of alignment.

The importance of spot bowling cannot be over-emphasized, as it has a decided advantage over pin bowling. The individual who looks at the pins usually is not as consistent; a point of aim sixty feet away makes accuracy difficult. A spot bowler, on the other hand, always knows where he starts his ball and how he rolls it.

Range Finders

The range-finder, (Figure 37) designed for the spot bowler, is a system of directional guides to aid in determining the correct path for the ball. It consists of four kinds of markers:

seven alley darts arranged scientifically in the alley bed starting 13'10" beyond the foul line
ten angle spots 7' beyond the foul line to establish the correct angle for the path of the ball
seven delivery spots on the approach side of the foul line to help check footwork accuracy
two sets of starting markers 12' and 15' behind the foul line to help each bowler find his correct starting position based on the length of his own stride.

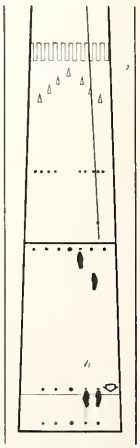


Figure 37. Range finders.

On alleys without range finders, the bowler must locate a spot comparable to the darts. This selection is not too difficult because, about 15' down the alley, the maple and pine boards join. At this clearly noticeable dovetail a spot approximately eleven boards in from the right-hand gutter is comparable to the second range finder dart. A piece of adhesive tape temporarily placed at this spot helps beginners fix their point of aim.

Path of Ball (Figure 38.)

The following device, preferably set up on an end alley, gives a clear, visual demonstration of the path of a straight ball and enables each bowler in a class situation to locate an exact spot: one end of a 75 foot string or lightweight rope is attached with adhesive tape to the deck directly in front of pin five. Pins one, three, and five are lowered to the deck. The rope is fastened at the foul line eight boards in from the right gutter, and remainder of the rope is extended along the approach straight back from this point. The rope passes just to the right of the bowler's right foot as he assumes his starting position. Another piece of adhesive tape is placed on the rope six to twelve inches beyond the foul line. The ball first touches the alley on this spot. Without range finders, a piece of adhesive tape or a target placed over the rope at the junction of maple and pine boards indicates the point of aim. With range finders, the rope bisects the second dart from the right gutter, clearly showing the point of aim. The entire length of the rope shows the path of a straight ball.

It is essential that a bowler realize that a one board difference at the point of release will make a three or four inch difference at the pins; this slight margin of variation means blows or cherries instead of strikes or spares. Many bowlers are so inconsistent that each delivery varies by more than one board. Little wonder that the casual bowler has trouble converting leaves to spares! Each bowler should make it a point to check himself on every delivery.

Check Points for the Spot Bowler (Figure 39.)

1. Did the ball hit the spot? If not, how far off was it?
2. Where did the ball hit the pins?
3. Was the follow-through directed through the spot?
4. Is the left foot still parallel to and on the same board on which it started?
5. Was the action of the ball normal? (straight, hook, etc.)

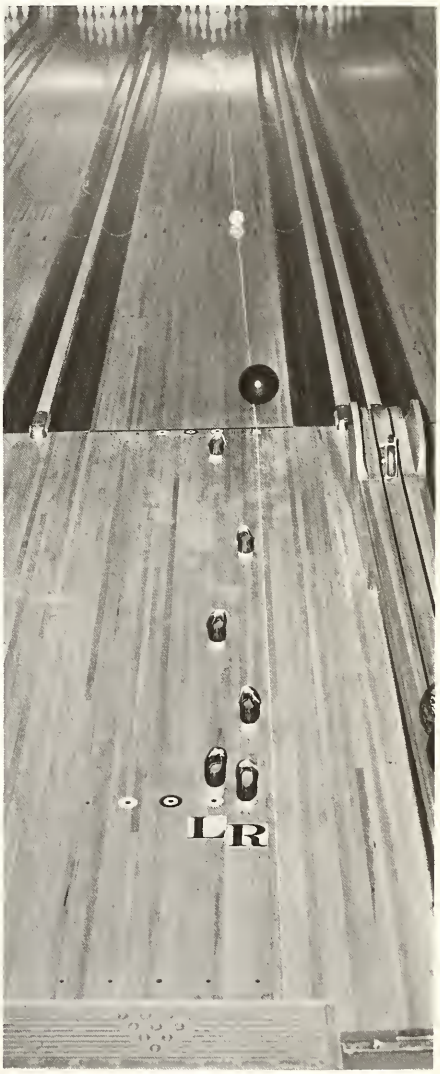


Figure 38. Approach and path of straight ball with targets.

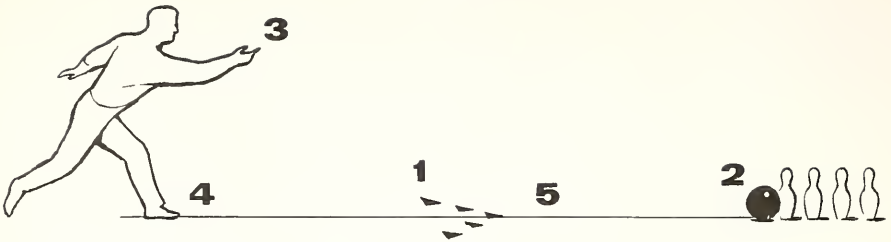


Figure 39. Check points for spot bowlers.

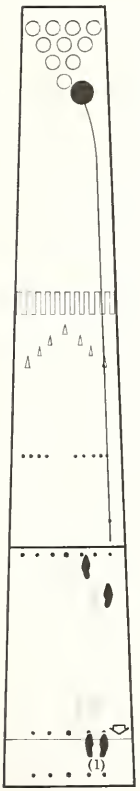


Figure 40. Path of hook ball from two starting positions.

Some novices have difficulty in focusing on the chosen spot; they tend to raise their eyes too soon. It will help beginners concentrate on looking at the spot if they will practice spot-shadow bowling, i.e., bowl without any pins set up, and look only at the range finder guide. Another device that can help develop a spot bowler's ability to look at his spot is the placing of an obstacle, such as a portable blackboard, across an alley so that it hides the pins.

If, after a careful check of many deliveries, a bowler finds that everything seems correct except point number 2 (i.e., where his ball hits), he must make an adjustment, probably by moving his starting position. If his ball has been hitting slightly to the right of the pocket (not carrying the five pin), he should move one board, or perhaps only half a board, to his right. If he fails to strike because his ball consistently crosses over too far, he should move slightly in toward the middle of his alley. In other words: a bowler moves his stance in the direction that his ball misses the head pin.

Hook Ball Delivery

When a person with a hook ball delivery is a spot bowler (1) his spot must be to the right of that used by a straight ball bowler, or (2) if he chooses the same spot, his stance must be to the left. The amount his ball breaks or hooks will determine how far to the right his spot will have to be, or how far to the left he will have to adjust his stance. Note this difference as indicated in Figure 40. (1) and (2).

Leave Conversions

Every expert spot bowler will have his own system, or theory, for converting leaves to spares. There is no panacea; there are only a few basic principles that can be set. From these, each bowler can develop his own method, depending on his individual style of delivery.

One principle that is followed by most high-average bowlers is cross-alley bowling. When a leave remains on the left side of the alley, the ball is started from the right hand side; when pins are left up on the right side, the ball is started from the left side of the alley. Exactly how far each bowler moves depends upon the leave and his type of delivery.

Another basic principle is, that the ball itself should hit as many pins as possible. An example of this follows: in order to pick up the 3-10 baby split, the ball should hit the right half of pin three and continue on to hit pin ten. This split can be converted by hitting the left side of pin three,

sending it (pin three) into pin ten, but this is not a recommended procedure because of the inaccuracy of a flying pin.

Ball Deflection

When attempting to convert a leave into a spare, deflection and distance must both be considered. Contact with a pin or pins deflects a ball from its path. The amount of deflection depends upon the angle at which pins are contacted, the speed of the ball, the type of ball rolled, and the weight of the pins being used. Heavier pins cause more ball deflection than do lighter weight pins. Allowance for deflection is essential in the conversion of such leaves as the "baby" splits (2-7 and 3-10) and the 5-7 and 5-10 splits.

Length of Ball Path

Distance enters the picture when the bowler realizes that to hit pins in the two back rows he must control the ball for a greater distance -- thirty inches more, if the leave is in the back row. A hook ball must be aimed a trifle more to the right in order to prevent the ball from passing to the left side of the leave. This added distance means that more accuracy is required to obtain spares when pins in the 4-5-6 or 7-8-9-10 rows are left standing after the first ball.

Specific Directions for Leave Conversions

From a brief description given on television by Buddy Bomar, and with his consent, the authors have developed the following method of converting leaves to spares and have found it most effective. (Figure 41.) The four back pins (7, 8, 9 and 10) are used as guides for the starting position of the bowler's right foot. A straight-ball delivery will be considered first. To roll a strike, the bowler lines up his right foot with pin 6 which is approximately eight boards (inches) in from the right-hand gutter. He attempts to roll his ball just to the left of the second dart from the right-hand gutter. This "strike" ball should also be used for leaves 1-3; 1-3-5; 5; 5-8-9; and the 8-9 split. (Figure 42.)

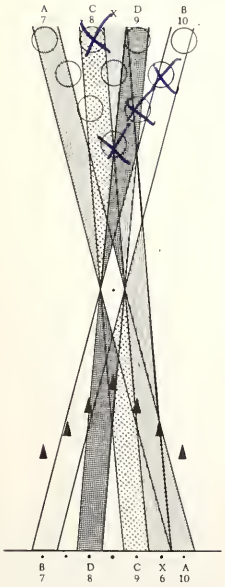


Figure 41. Ball paths for leave conversions.

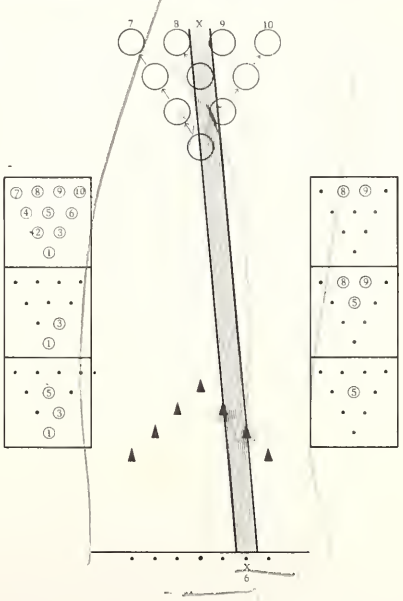


Figure 42. Leaves converted by use of strike ball delivery.

For leaves on the far left side, the bowler lines his right foot up with pin 10 which is three boards (inches) in from the right-hand gutter. On the approach, at either the 12' or 15' row of dots, this point is seven boards to the right of the extreme right-hand dot. At the foul line, it is two boards to the right of the right-hand dot. The ball should pass exactly between the second and third darts from the right-hand gutter. This ball should convert the following leaves: 7; 4; 4-7; and 4-7-8. (Figure 43 path A.)

For leaves involving chiefly the 2, 4 and 8 pins (path C, Figure 41.) the right-foot position is in line with pin 9. On the approach and at the foul line, this spot is the dot to the right of center. The path of the ball is exactly between the third dart from the right and the center dart. This ball is used against the leaves shown by path C Figure 44.

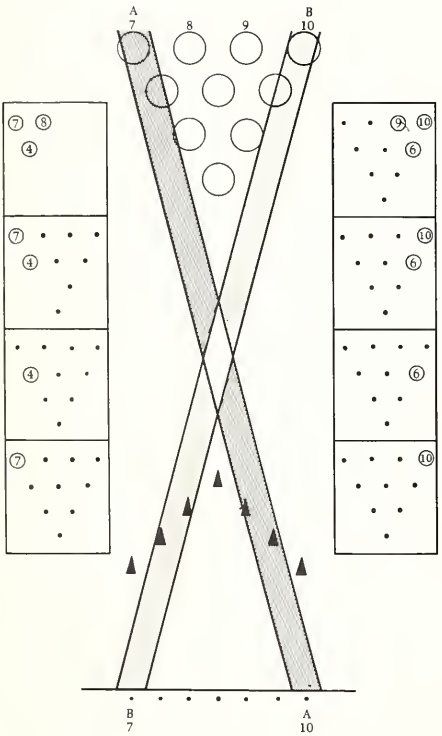


Figure 43. Leaves converted by use of 7 pin and 10 pin deliveries.

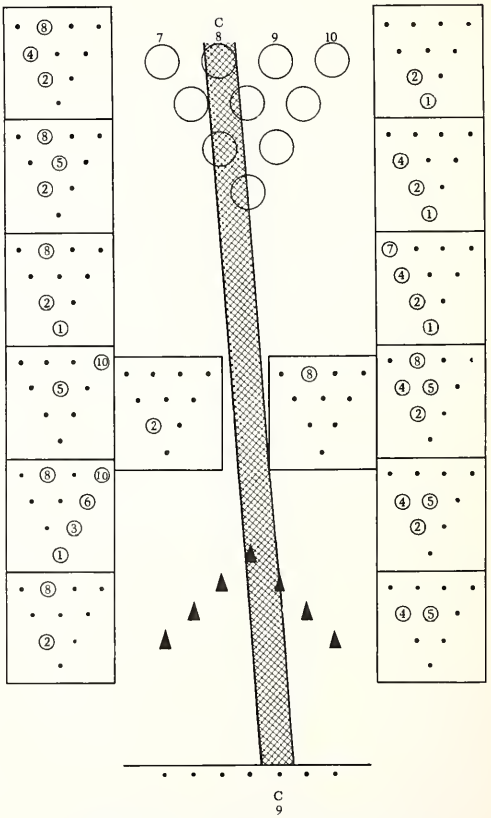


Figure 44. Leaves converted by use of 8 pin delivery.

For leaves centering primarily around the 9 pin (path D, Figure 41.) the bowler moves his starting position to the left of the center of the approach and places his right foot on the dot to the left of center which is in line with pin 8. His ball should pass directly between the center dart and the one to its immediate left. This ball should cover the leaves shown in Figure 45.

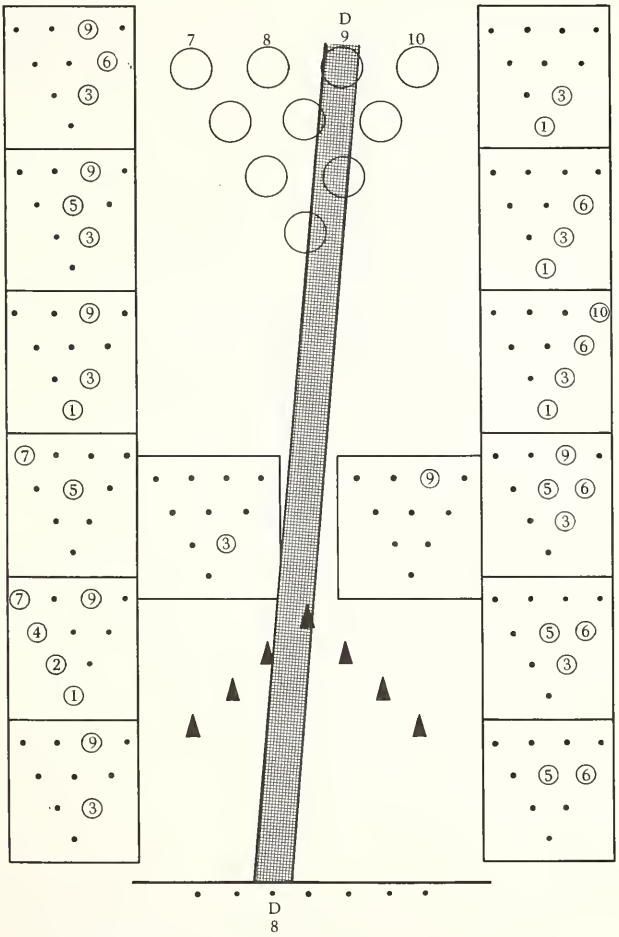


Figure 45. Leaves converted by use of 9 pin delivery.

For leaves on the far right side, the bowler continues to move his starting position farther left and uses pin 7 as his guide. On the approach, at either the 12' or 15' row of dots, the bowler will be seven boards to the left of the extreme left-hand dot. At the foul line this point is two boards to the left of the left-hand dot. His ball should pass exactly between the second and third darts from the left gutter. This delivery should convert the leaves shown by path B, Figures 41 and 43.

For leaves 2-4-7, 2-7 (Figures 46 and 47) and 2-5-7, the bowler should stand halfway between positions A and C of Figure 41 and aim his ball directly over the third dart from the right gutter. Conversely, for the 3-6-10, 3-10 and 3-5-10 leaves, he stands halfway between positions B and D of Figure 41, and the ball's path is directly over the third dart from the left gutter.

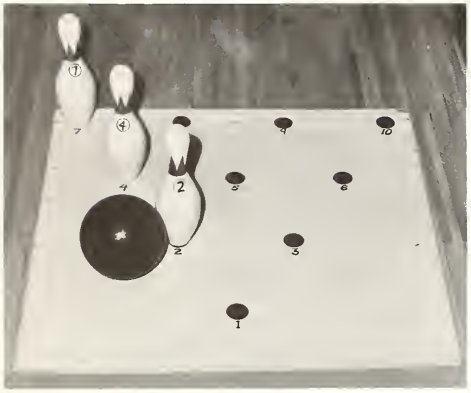


Figure 46. Conversion of the 2-4-7 leave.

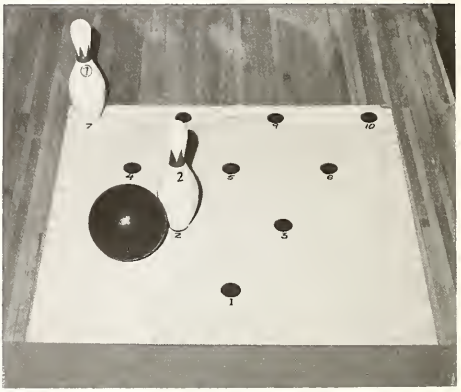


Figure 47. Conversion of the 2-7 baby split.

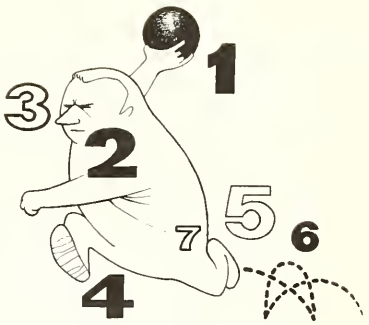
This discussion has not covered every possible combination of pins that might remain after the first ball of a frame has been rolled, but, following this same principle, only minor adjustments in starting position and point-of-aim will be necessary for other leaves.

The person with a hook-ball delivery will find that his "spot" or point-of-aim will be to the right of those given in the preceding explanation. How far to the right will depend on the amount of "break" his own particular delivery imparts to the ball.

The method just described, of guiding by pins in the back row, is specific, clear, easy to follow, and effective. Not all bowlers will adopt it, but in an instructional situation, it provides a concise basis from which individuals can digress as they develop their own techniques.

chapter 9

Analysis of Errors



Frequently a bowler or an instructor has need of a ready reference to assist him in determining the cause of a particular error. If he takes the time to scrutinize the various chapters of a book, he may or may not find the solution to his problem. Even if the reference is found, much valuable time is consumed in the search.

The following pages attempt to solve this problem by cataloging various bowling positions and movements. Opposite these delivery situations, by following the respective columns to the right, a right-handed, straight-ball bowler may analyze his errors. A left-handed person will benefit from the chart by transposing the opposite foot or arm for the one indicated.

To use the chart, the bowler looks in the first column on the left under stance, approach, release or follow-through. Under these four headings the reader will find a listing of the positions or movements affecting the bowler's delivery. Column two lists errors deviating from recommended bowling form. Following the columns in order to the right, a bowler will find the probable cause of the errors, the possible reaction on the overall delivery, and some ways to correct these faults.

Used properly, this chart assists bowlers in quickly analyzing and correcting their faults.

ANALYSIS OF ERRORS

Straight Ball Delivery
Four Step Approach

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
I. Stance A. Position of feet				
	1. Feet spread too far apart	Tenseness	Zigzag approach	Move feet closer together to normal relaxed standing position
	2. Feet at an angle to the boards of the approach (toes pointing to the right)	Unawareness (beginner) or incorrect practice (experience) copying another bowler	Right foot steps over left; walk to right; shoulder turned to right, or ball may swing behind body	Start with feet parallel to boards of approach

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
A. Position of feet (cont.)				
	3. Right foot forward	Unawareness (beginner)	Left foot takes first step	Start with feet together or left foot slightly forward
B. Position of ball				
	1. Ball held too high	Sighting over ball; copying other bowlers	Backswing too high	Start ball about waist height
	2. Ball held to left of center of body	Supporting ball with left hand only; right hand on top or at side of ball	Curved arm swing; erratic delivery	Hold ball at center of body; place both hands under ball
C. Position of bowling hand and fingers				
	1. Squeezing the grip too tightly	Tenseness; incorrect fit	Tends to loft ball; causes undue strain and tires hand muscles	Use comfortable relaxed grip
	2. Thumb and palm of hand facing left	Unawareness of correct position; copying another bowler; feeling more natural	Ball tends to cross alley to left	Turn hand so thumb and palm are up
	3. Holding ball with palm of hand and thumb facing floor	Inattention during instruction; inadequate knowledge of proper use of muscles	May drop ball on backswing; no lift; ball skids	Place hand under ball
	4. Curled little finger	Unawareness	Inadequate lift on ball; ball may curve slightly; poor control	Extend index and little finger flush against ball
	5. Wrong fingers in holes of ball	Unawareness; inattention during instruction	Loss of control; ball may back up	Place thumb, middle and ring fingers in holes
D. Distribution of weight				
	1. Weight on right foot	Right foot forward; lack of concentration; inattention to instruction	Three step approach; may slide on wrong foot at foul line; poor timing	Weight equally distributed or more weight on left foot

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
II. Approach				
A. Pushaway and step one				
	1. Pushaway completed before first step is taken	Unawareness; uncertain of correct start; incorrect timing	Awkward delivery; may make delivery on wrong foot; skip or hop in approach; may have to hold back on delivery until feet catch up	Execute pushaway and first step simultaneously
	2. Dropping ball straight down on first step	Unawareness of correct feel in pushing ball away; poor muscular control; ball too heavy	Ball hangs dead during approach or ball is forced awkwardly into a swing	Push ball forward to a straight elbow position (about a 45° angle from shoulder)
	3. Bending too far forward from the hips	Weak musculature; incorrect use of muscles	May either decrease or increase height of backswing	Maintain upright position of trunk by keeping back muscles contracted
	4. Lifting ball on pushaway	Unawareness; sighting over ball	Backswing too high; feet reach foul line ahead of ball resulting in a forced delivery	Push ball straight forward or slightly downward
	5. Stepping forward with left foot on pushaway	Unawareness; weight incorrectly placed on right foot during stance	Awkward delivery; may slide on wrong foot at foul line; may skip or hop in approach	Weight left foot during stance; step forward with right foot on pushaway
	6. Completing first step before starting pushaway	Unawareness; uncertainty of correct timing	Timing similar to three step approach; sliding foot beats ball to foul line forcing the delivery	Push the ball and step with right foot simultaneously
	7. Pushing ball too far to the right on pushaway	Unawareness	Ball swings behind back; if arm swings straight, ball may be guided to right of point of aim; curved arm delivery may result	Push ball straight forward

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
B. Middle steps (2 & 3)				
	1. Stopping ball momentarily during any phase of approach	A poor start resulting in footwork and ball being uncoordinated; footwork too slow to keep up with ball	Erratic delivery; loss of power	Start ball and foot simultaneously; allow ball to swing freely; speed up footwork to keep up with ball
	2. Swinging ball out to right on backswing	Bowler too conscious of rolling diagonally from right corner of alley toward pin five	Pulls ball to left; bowler falls off balance to right	Keep arm close to body
	3. Using circular arm swing	Incorrect conception of hook-ball delivery; weak pushaway; a curved pushaway from left to right; bent elbow and wrist; holding ball to left of center of body	Erratic delivery; if ball is released early, it goes to right -- if released late, it goes to left; bowler falls off balance to right	Push ball straight from shoulder, shorten backswing, keep elbow close to body with a firm wrist; swing arm parallel with floor boards
	4. Pausing or hesitating on each step of approach	Concentrating too much on form; checking each coordinated action on every step	Erratic delivery; ball gets ahead of feet or bowler resists swing of ball by holding it back	Let ball swing freely and move feet fast enough to keep up with ball
	5. Skipping or hopping (usually in place of third step)	Making the first two steps too long or too slow; hesitating on first two steps while allowing ball to swing freely	Feet attempt to catch up with ball causing erratic delivery	Shorten approach to approximately ten feet until error is corrected; drag feet through approach until error is corrected
	6. Bending wrist and/or elbow on backswing	Attempting to hook ball; copying another bowler; fear of losing grip and dropping ball on approach	Erratic delivery; early muscle fatigue reduces effectiveness of delivery	Keep wrist and elbow straight from pushaway to release
	7. Zigzag approach	Stepping to the right with the right foot and to the left with left foot; right foot crossing over left and left crossing over right	Erratic delivery	Make several practice approaches watching own feet starting and ending on same board

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
B. Middle steps (2 & 3) cont.				
	8. Diagonal approach (to left)	Feeling that ball should be released near center of alley; attempt to get body out of path of swinging ball	In pin bowling ball crosses to left; in spot bowling, ball tends to travel to the right	Walk straight forward from starting spot
III. Release A. Sliding foot				
	1. Turning parallel to foul line (left foot turns to right)	Allowing free right foot to swing too far to the left; crowding the foul line	Turning of left foot is transferred through the body to the shoulder frequently resulting in a delivery to the right side of the point of aim	Hold free foot in pushoff position during slide instead of allowing it to swing left; keep shoulders and hips parallel to foul line; emphasize reaching through point of aim on release
	2. Sliding diagonally to the right	Starting too far to the left, rolling at a spot to the right of release position; attempting to keep the ball close to the left leg; walking toward point of aim (if it is to the right)	Tendency for ball to go to the left	Take a few practice deliveries (without ball), looking at the spot on the approach where the slide should end; repeat, using ball
	3. Sliding diagonally to the left	Taking stance too far to the right; walking in direct line toward point of aim (if it is to the left)	Tendency to push ball to right	Same as #2
	4. Hitting ankle of sliding foot with ball	Sliding to right; allowing ball to swing away from body on backswing so that it swings into the foot on the downswing	Erratic delivery; gutter ball	Slide straight forward; straight pendulum swing of right arm

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
A. Sliding foot (cont.)				
	5. Habitually sliding across foul line	Making first two steps of approach too long or standing too close to foul line	Foul is committed	Shorten first two steps; take stance farther from foul line; if already standing at maximum distance, it sometimes helps to shorten approach to force bowler into taking shorter steps
	6. Sliding on right foot (right-handed bowler)	Starting approach on wrong foot; taking steps too slowly; allowing ball to reach foul line ahead of left foot; incorrect timing; poor body mechanics; lack of knowledge of theory of "opposition"	Erratic delivery; tendency to force ball on downswing; body ends off balance	Start pushaway and first step on right foot simultaneously; feet must keep up with ball
B. Ball				
	1. Ball hitting floor before release (at bottom of forward swing)	Bending forward at waist; sinking too soon on left knee; dropping right shoulder; backswing too high	Loss of control; erratic delivery	Use medium backswing; keep shoulders level; slide with shoulders over left knee
	2. Releasing or dropping ball early (at bottom of forward swing)	Hand leading ball; incorrect timing (late arm swing); attempting to throw a cannon ball (backswing too high); finger holes of ball too large; ball with incorrect span, tired bowling fingers; no slide; relaxing grip	Loss of control; erratic delivery	Place ball on alley 12 to 18" beyond foul line; pushaway with first step; medium backswing; correct fit of ball; smooth slide

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
B. Ball (cont.)				
	3. Lofting ball	Attempting to throw a cannon ball; finger holes too small; holding on to ball too long; allowing thumb and fingers to leave ball simultaneously	Loss of control; erratic delivery	Use medium backswing; correct fit of ball; release ball on start of upswing with thumb leaving ball first
	4. Skidding ball (ball slides 15 to 25 ft. before starting to roll)	Thumb and fingers leave ball simultaneously; releasing ball with back of hand up (thumb down); pulling hand out of ball instead of following through	Dead ball (ball has very little mixing action at pins)	Keep thumb up; release thumb first; use a good follow-through (reaching through the target)
	5. Backup ball	Incorrect hand position (little finger side of hand lifts more and follows through above index finger); a reverse curved arm swing with ball swinging outward at either end of pendulum swing	Ball fades to right for right-handed bowlers	Lift slightly with index finger at release; use straight pendulum arm swing; do not allow little finger to curl
	6. Insufficient speed on ball	Inadequate push-away; hesitating after each step; approach too short; short backswing; resisting the arm swing; poor coordination	Poor control; greater ball deflection on contact with pins; pins fall too gently to obtain optimum score	Lengthen approach; increase speed of approach; forceful motion in push-away; relaxed pendulum swing; use lighter ball
	7. Speedball (cannonball)	Lifting ball on on pushaway (feeling that the number of pins knocked down is directly proportional to the speed of the ball); backswing too high, forcing the ball through the forward swing; approach too long; beating ball to foul line	Poor control; the same hit will carry fewer pins than a medium speed ball; pins are lifted vertically from the alley, more splits result; ball hits to left of head pin	Push ball straight forward; shorten backswing; use smooth relaxed rhythmic forward swing; shorten approach; use ball of proper weight; long slide with "soft" knee as ball moves into forward swing

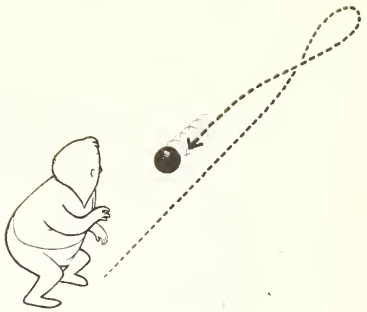
POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
B. Ball (cont.)				
	8. Pulling ball to left	Swinging ball from right to left; forcing ball through forward swing; follow-through to left of point of aim	Ball hits to left of pocket	Use straight pendulum swing; relaxed forward swing; reach through point of aim during follow-through
C. Shoulders				
	1. Not parallel to foul line	Left foot turning to right to avoid crossing foul line; allowing free right foot to swing too far to the left; inadequate use of free arm for balance; curved arm delivery; copying another bowler's incorrect form	Erratic delivery; ball frequently goes to right of point of aim	Hold free right foot in pushoff position during entire release permitting left foot to slide parallel to floor boards; right hand reaches through point of aim as left arm swings outward and back for balance
	2. Dropping right shoulder	Backswing too high; ball too heavy; poor muscular control	Loss of balance (fall to right); erratic delivery; ball may hit floor at bottom of swing	Shorten backswing; allow free left arm to swing outward and backward; keep shoulders level
D. Free right foot				
	1. Swings or steps forward and to the right on release	Curved arm swing; ball swings too far from body dropping right shoulder; poor balance; shoulders too far forward; stiff left knee	Shoulders and ball swing to left	Keep arm swing straight; keep ball close to body; allow free leg to swing comfortably to the left; maintain good balance with long slide and "soft" left knee
	2. Swings too far to the left	Left foot turns too far to right; body turns to right; incorrect use of left arm	Erratic delivery; ball is frequently thrown to right of point of aim	Slide left foot parallel to the boards; keep free right foot in pushoff position during release; allow free arm to swing outward and backward

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
E. Balance				
	1. Falling off balance to the right	Inadequate use of free arm and leg as counter balance; allowing ball to swing too far from body; stiff left knee; leaning too far forward on release; dropping right shoulder	Ball frequently goes to left of target; free foot is sometimes forced forward to catch the weight; hop may occur on left foot after delivery	Allow ball to swing close to the body; permit free arm to swing outward and backward and free leg to swing slightly left, acting as a counter balance to the ball; slide with soft left knee
	2. Weight too far back at release	Stiff left knee; shoulders behind hips during slide; slippery approach or shoe	Slide over foul line; erratic delivery; bowler may fall backward	Keep shoulders over "soft" left knee; remove slippery substance with material provided by alley manager
	3. Weight too far forward at release	Stiff left knee, sticky shoe or approach, shoulders ahead of left foot at slide	Erratic delivery; may either drop or loft ball; may fall forward over foul line due to interrupted slide	Keep shoulders over "soft" left knee; raise shoulders and lower hips; clean approach or shoe with material provided by alley manager
IV. Follow-through				
	1. Inconsistent follow-through	Hesitating after release before following through; follow-through to left or right of point of aim; exaggerated follow-through on one delivery and a weak one on the next	Reaction of hesitation on ball -- same as no follow-through; erratic delivery (ball follows direction of arm swing); action on ball will be inconsistent	Use a consistent exaggerated reach through the target with the right hand ending in front of the right eye
	2. No follow-through	Pulling hand backward from ball; cutting the swing short	Erratic delivery; either dead or sliding ball	Use a smooth, rhythmical reach through the point of aim

POSITIONS & MOVEMENTS	COMMON ERRORS	PROBABLE CAUSES OF ERROR	POSSIBLE RESULTS ON OVER-ALL DEL.	CORRECTION
IV. Follow-through (cont.)				
	3. Reaching to the right of point of aim	Incorrect approach; pushaway to right; backswing behind body resulting from diagonal swing	Ball goes to right of target	Watch the right hand reach through the target on several deliveries; pendulum swing parallel to floor boards
	4. Crossing the body with right arm	A curved arm delivery; pulling the ball; shoulders not parallel to foul line on release; diagonal approach	Ball usually goes to left of target	Straight pendulum swing; reach through point of aim; release ball beyond foul line to right of left foot; walk straight forward from starting point

chapter 10

Hook, Curve, and Back-up Balls



Straight, hook, curve, and backup balls acquired their names as a result of the path which they take and their action between the foul line and the pins. Since the straight ball has been discussed earlier, this chapter is concerned mainly with the other three. During the discussion, if the beginner will consult Figures 48, 49, 50 and 51 frequently, he will see more readily the advantages and disadvantages of each ball.

Hook Ball (Figure 49.)

A hook ball starts rolling straight down the lane parallel to the right gutter and directly toward the three or six pin (depending upon the amount of hook). Shortly before reaching the pins, the ball breaks sharply to the left into the one-three pocket and through the five pin.

Rolling a hook ball is the ambition of beginners and the favorite ball of experts, but before attempting it, the beginner should feel competent of his ability to roll a straight ball consistently. Until he can repeatedly make each successive approach identical with his preceding approach, the beginner should avoid experimenting with a ball that hooks or curves. When he has a consistent, well-synchronized delivery which is automatic and requires little concentration throughout the approach, and when he can maintain a consistent average of about 150 with a straight ball, the bowler then and then only should attempt to change to a hook. It seems reasonable to assume that a person who is unable to control a straight ball for a 150 average would find no end of trouble in controlling a ball that breaks.

Advantages

A consistent, well-timed approach is the key to successful bowling regardless of the type of ball rolled. All other things being equal, the hook ball will consistently carry more pins and leave fewer splits than any other pocket hit. The reason is simple enough, since the hook ball has two forces working in its favor when it contacts the pins: forward spin and counterclockwise spin. These combined forces of a "working" ball result in a "mixing" action on the pins, causing them to spin as they fall. Two or three fifteen-inch, spinning pins are very effective bulldozers on a bowling lane forty-two inches wide.

Another advantage of the hook ball is that it enables the bowler to increase the angle at which the ball enters the one-three pocket. For example, if a bowler delivers a straight ball from the extreme right-hand corner of the lane and the ball enters the pocket, he has less than a two degree angle on the pins. Using such a small angle, a straight ball may easily be deflected enough from the one pin to miss completely the five (king) pin. On the other hand, if a hook is used, the ball breaking sharply into the pocket increases the angle so greatly that if the bowler were rolling a straight ball, he would have to be standing about two lanes away to obtain an angle of the same degree. A hook ball has from two to four times the angle on the pins as a straight ball. This angle decreases the amount of deflection and increases the potential for carrying the five pin and making strikes.

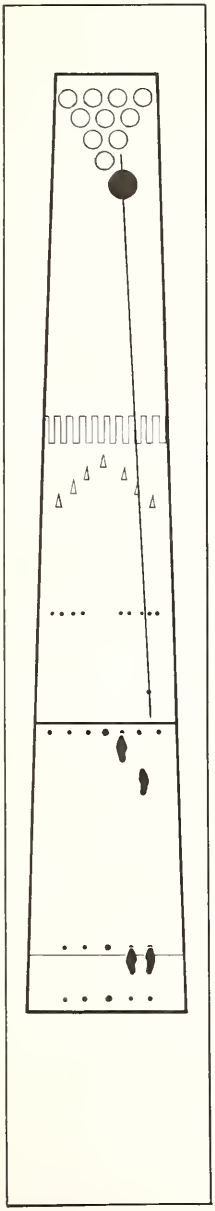


Figure 48. Path of straight ball with starting and release positions.

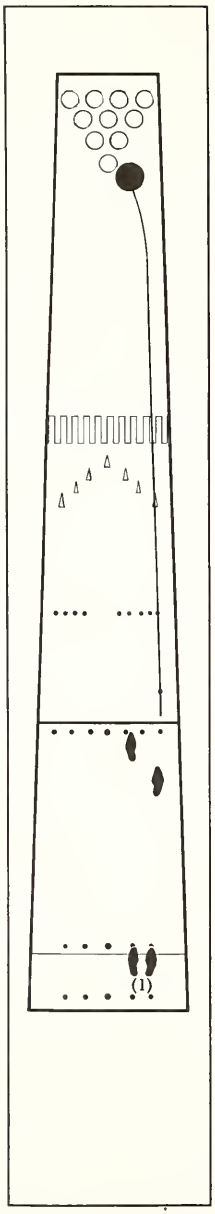


Figure 49. Path of hook ball with starting and release positions.

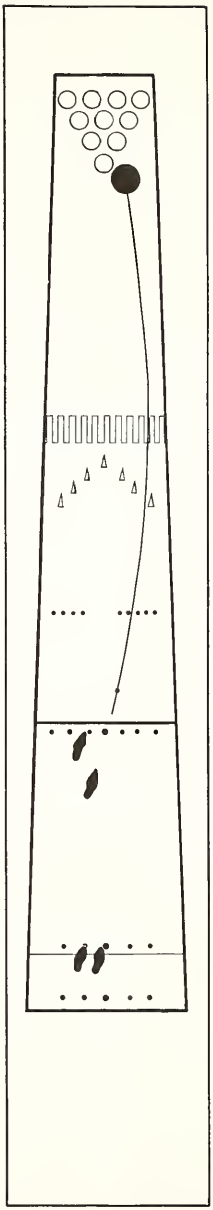


Figure 50. Path of curve ball with starting and release positions.

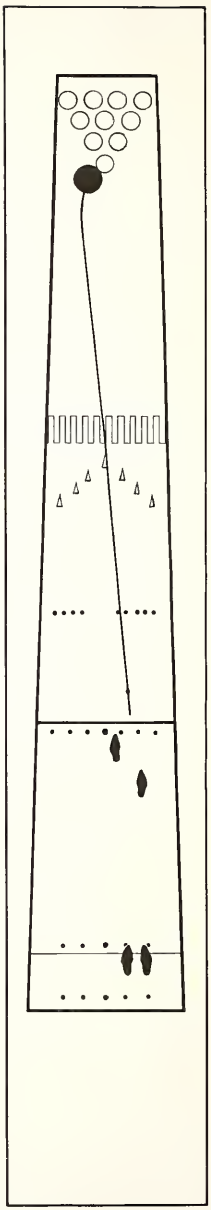


Figure 51. Path of back-up ball with starting and release positions.

Delivery

Rolling a hook requires the bowler to make very slight changes in his over-all approach. Body position, footwork, pendulum arm swing, timing and coordination are identical with that of a straight ball delivery, but hand position and point of aim are decidedly different. To deliver this type of ball, a bowler may take his stance on the same spot he used when rolling a straight ball, but many experts prefer to start slightly to the right of the center of the approach. Each individual, by experimentation, must determine the starting spot that is best for his delivery.

Point of Aim

Aiming a hook ball is a challenge to anyone first attempting its use since most bowlers do not look at the pins. The hook bowler who does use the pins as his target must aim to the right of the one-three pocket. The spot bowler moves his spot from two to six boards to the right of his straight ball spot Figure 40 (1) or, if he keeps his original spot, he moves his stance the same number of boards to the left. Figure 40 (2). All of these distances must be approximate since everyone does not have the same amount of hook. A great deal of experimentation and practice is required of every bowler attempting to roll and control a hook.

Hand Position

The following diagrams illustrate the simplest way to change the hand position from a straight ball to a hook ball delivery. (Figures 52 and 53.)

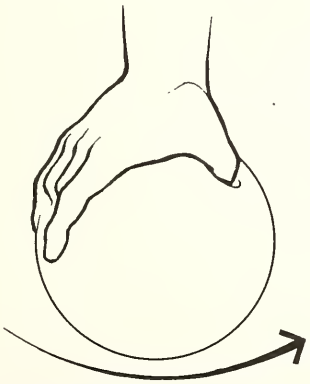


Figure 52. Hand position for straight ball delivery.

Figure 53. Hand position for one variation of hook ball delivery.

In order to roll a hook, the hand is rotated a quarter of a turn to the left so that the thumb is next to the body throughout the swing. At the release, the V formed by the thumb and forefinger is pointed directly toward the target.

Reaction of Forces

Understanding why a ball hooks depends upon a knowledge of the forces that act upon it. A straight ball has two forces governing its direction down the alley: forward momentum and forward spin. Momentum is the impetus given the ball, due to the gravitational pull, during the forward motion from the peak of the backswing. This force acting alone would tend to make the ball scoot or slide down the alley but the second force, forward spin, acts to prevent this from happening. Forward spin results from an explosive release. As the ball starts upward and forward

from the bottom of the pendulum swing, the thumb leaves first and there is an explosive lift with the fingers putting a forward spin on the ball. The forward spin works to get the ball rolling immediately although it is the weaker of the two forces.

By changing the position of the hand as indicated earlier from the straight ball to the hook ball position, a third force, counterclockwise spin, acts upon the ball. Since the hand is turned with the thumb toward the body at the release of a hook ball, and since the thumb leaves the ball first, the explosive lift starts the ball turning in a counterclockwise direction because the lift is now applied from the sides of the fingers.

A ball hooks as a result of these forces. The forward momentum is the strongest of the three forces at first and the ball tries to scoot down the alley, but about a third of the way to its target, the forward spin takes over so that a rolling motion has completely replaced any slipping or scooting. By the time the ball has traveled two thirds of the way to its target, friction from the alley surface has slowed its speed allowing the counterclockwise spin to begin showing its effect thus permitting the ball to break sharply to the left. The result of these three forces acting in this way is only possible because the ball is heavy and the surfaces of both the ball and alley are highly polished. If the ball were light and the friction great, the counterclockwise spin would be a greater force and the ball would shoot off to the left almost immediately from the point of release.

Hand position in rolling a hook may vary from the position described, which was one quarter of a turn to the left of the straight ball position, to any position between these two. At the bottom of the swing the hand may be on top, behind, under or to the side of the ball, but in all instances the most important point is the explosive lift with the sides, or near sides, of the fingers after the thumb has been removed.

Classifications of Hook Balls

Hooks can be classified in several ways depending upon the hand position, the amount of lift, and direction of the lift at the moment the ball is released. Four classifications will be used here: (1) Full Roller (2) Semi-Roller (3) Full Spinner (4) Semi-Spinner. Of these four classifications, each may be generally identified by the track left on the ball. The track is a line or ring around the ball resulting from its spinning against the alley surface. Ball track position and width may vary greatly from one bowler to another, depending upon speed of the ball, counterclockwise spin and the angle of these spins, amount of lift, and the angle the bowler has on the pins. Varying any one of these factors can make a decided difference in the sharpness and effectiveness of a hook. A brief description follows of four of the normal places a ball tracks.

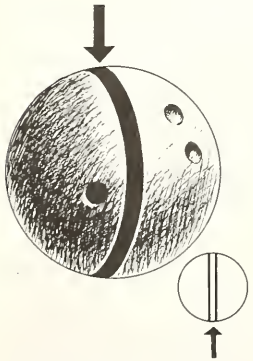


Figure 54. Full roller ball track.

Full Roller

The full roller can be identified by a narrow ball track somewhere between the finger and thumb holes so that the ball is rolling nearly over its center. (Figure 54.) This ball is released with a moderate to medium amount of lift when the hand is in the position described earlier, thumb toward the body and the V straight ahead. Beginning hook bowlers should probably experiment with the full roller first since it is delivered similarly to the straight ball except for the hand position, and it is not a very sharp breaking hook. The full roller is a good pin getter in either pocket because of its strong forward rolling action. Its ability to hold well regardless of alley condition makes it the best strike ball for a Brooklyn hit.

Semi-roller

The semi-roller has a narrow ball track similar to the full roller, but its location is outside of the thumb hole. (Figure 55.) A ball track in this position clearly indicates that more ball weight is on one side of the track than on the other. For that reason more lift is required to hold the ball on this one-sided track than for the

full roller. Since the ball is rolling on a track that traverses only forty percent of its circumference, the result is a flywheel action which causes the ball to break more sharply than does the full roller. This flywheel action and increased counterclockwise spin, due to the added lift, terminates in a hard hitting ball that will carry the five pin on most any pocket hit. The semi-roller is not as effective on a Brooklyn hit as is the full roller because the same forces helping the ball break more sharply also make it break away faster when it crosses over.

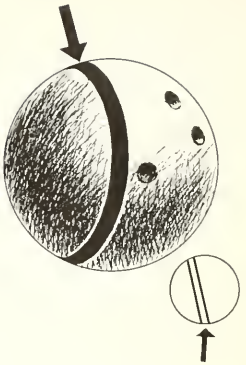


Figure 55. Semi-roller ball track.

Full Spinner

Least effective of hook balls is the full spinner. For this reason it is the least desirable and the least used by expert bowlers. It rolls on a narrow track on the side of the ball opposite the finger holes. (Figure 56.) Generally, this ball is delivered by beginners who are attempting incorrectly to copy a hook ball delivery of someone they have seen. It is frequently the result of a round house delivery with the hand directly on top of the ball. The round house swing gives a right-to-left spin on the ball similar to a spinning top (thus the name full spinner). A spinning top will dart away from any object it touches and so it is with the full spinner. Since there is no lift to provide forward spin, this delivery has no holding power. Acting as a top spinning down the alley the full spinner will tend to dart away and to terminate with a weak hit in either pocket. Line of direction with this ball is extremely unstable. The arm is swinging on a curve so, if the ball is released early it will veer off to the right, but if released late it is pulled to the left and this latter error is the more frequent.

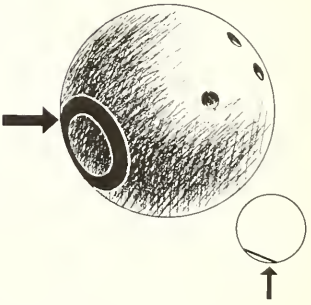


Figure 56. Full spinner ball track.

Semi-spinner

The semi-spinner has a very wide breaking curve, explosive in its ability to carry pins on a pocket hit. (Figure 57.) It is, however, a very poor risk on the Brooklyn side, because the ball breaks away quickly after crossing over. The ball track is wide and limited to approximately 30 percent of the ball's circumference. A wide ball track indicates that the ball starts out on the smallest circumference of the circle and, as the speed decreases, it works its way up toward the center. This track and the wide hook action of the semi-spinner result when a ball is released with tremendous lift at slow speed with the hand starting under the ball. Good for strikes but only fair for spares, the semi-spinner is extremely difficult to control when rolling at pins on the extreme right side of the alley.

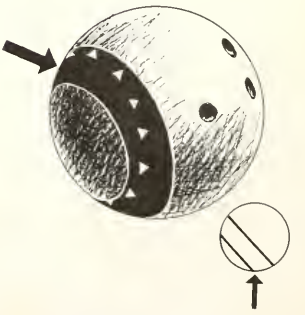


Figure 57. Semi-spinner ball track.

The preceding explanation makes it clear that more lift imparts more hook action to a ball. Slowing the speed with an equal amount of lift will also increase ball action. A "cannon ball" will not break but a medium speed ball will hook into the 1-3 pocket and is recommended for hook deliveries.

Curve Ball

A curve ball travels in an excessive arc from right to left and must, therefore, be rolled from the center of the lane to allow for the wide path it needs in its trip to the pins. This ball is delivered with a grip similar to that employed for a hook ball but the wrist is flexed, the fingers are more on the side and under the ball and an exaggerated lift is imparted at the moment of release. Consistency and control are difficult to attain because a curve ball is greatly affected by varying alley conditions.

Back-up Ball

A back-up ball breaks from left to right, like a slice in golf, and is equally undesirable. Many faults, such as poor timing, and lack of follow-through result in a back-up; but the primary cause is an improper grip at the time of release. The hand is too far under the ball, and as the ball leaves the bowler's hand, the wrist is turned in a clockwise direction so that the little finger is flicked upward. Lifting the index finger and emphasizing a good follow-through will usually correct a back-up. Changing to a hook ball delivery is sometimes the only cure for a back-up ball.

Fast Alleys

Alleys divide into two types, "slow" and "fast," in relation to the way a hook ball works, or "takes," on them. A fast alley has a highly polished, glassy surface, which makes it difficult for a hook ball to take hold. On a fast alley, a ball will not "come up" into the pocket; it continues to roll parallel to the right-hand gutter and hits pin three or pin six. To allow for this glassy surface, a bowler moves slightly to the right of his usual starting position.

Slow Alleys

On a slow alley, affording more traction, a hook ball "breaks" too much; the ball crosses too far to the left, hitting too high on the head pin, or, in extreme cases, knocking down only pins on the left side of the alley. In this case, the player moves more toward the center of the alley. This change reduces the angle of the shot, and gives the ball a wider arc in which to hook into the one-three pocket. If the ball still hooks too much, the speed of delivery is increased, but only as a last resort. The speed of the throw is changed only when all other methods fail to bring the ball into the pocket.

One disadvantage of a hook ball is the difficulty of being consistent on different types of alley surfaces. Therefore, until a bowler has thoroughly mastered all fundamentals, he should use only a straight ball delivery.

chapter 11

Evaluative Criteria

Methods of evaluating students in bowling vary widely from school to school and in different areas of the country. Since no single basis for marking would seem adequate or fair, many criteria may be employed. The material presented here is intended to serve only as a guide in aiding the inexperienced teacher who is required to give grades. A cross section of evaluating methods will be discussed briefly.

Bases for Marking

Some instructors rate students primarily on form, feeling that if correct form is learned, the score will increase progressively with practice. Others grade entirely on average, since the aim of bowling is to knock down the most pins in the fewest possible deliveries. Fortunately for the students, most teachers use a combination of these and include some of the following factors: selection of proper ball; use of orthodox delivery; improvement; written tests; ability to score; etiquette; number of pins knocked down on the first ball; consistency in scoring; cooperation; and attitude.

Handicap Tournament

A short handicap tournament at the end of a course adds interest and puts students on a fairly equal basis for competition. One way to determine a handicap for a beginning or intermediate bowler is to subtract his average from 180 and use seventy-five percent of the difference. A minimum of three games should be rolled for a handicap tournament.

Average

One method of determining average and improvement is to place each student's total score (or average) on a curve so that his position relative to every other student's performance may be observed. If the instructor will keep these records over a period of a year or two, the results will tend to fall into grade categories. The following charts on improvement, totals, and averages were developed after such a study. Scales will vary in different geographical areas and even from class to class; these are included only as examples or guides; each instructor should develop his own chart.

IMPROVEMENT CHART FOR BOYS
All Levels of Ability

Starting Average (First 3 games)	D	C	B	A
	Improvement in Average			
85-100	7	12	25	35
101-110	5	10	20	25
111-120	3	7	15	20
121-130	Hold average	5	10	15
131-140	Hold average	3	7	11
141-150	-3	Hold average	5	8
151-160	-3	Hold average	3	5
161-170	-6	-3	Hold average	3
171-180	-9	-6	-3	Hold average

Starting average: Average of first three games bowled in class.

Final average: Average of last six games bowled in class.

Numbers under letter grades: Indicate the increase in, decrease in, or ability to hold an average during the course; obtained by subtracting starting average from final average.

Average number of games bowled during a quarter: Beginners -- 12; Intermediates -- 15; Advanced -- 22.

The most accurate way to determine improvement, however, is not by consulting a chart or form but by putting the scores on a curve for each class.

Average Chart for Boys
Based on eight best games rolled

	Beginners	Advanced
A	157 and above	167 and above
B	144 - 156	154 - 166
C	112 - 143	122 - 153
D	91 - 111	101 - 121
E (fail)	90 and below	100 and below

The most accurate way to determine grades for a season's average is to plot a curve for each class.

Average Chart for Girls
Based on five best games rolled

	Beginners	Intermediates	Advanced
A	140 and above	152 and above	156 and above
B	126 - 139	140 - 151	146 - 155
C	106 - 125	120 - 139	126 - 145
D	96 - 105	104 - 119	112 - 125
E (fail)	95 and below	103 and below	111 and below

First Ball Totals

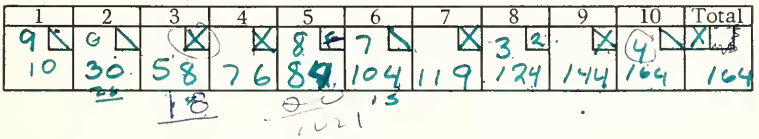
Some educators suggest that the number of pins knocked down by the first ball in each frame be used as one basis for rating beginning students. Studies show that at the end of 21-24 lessons, the average of beginning bowlers is approximately six pins on the first ball. Since the ability to pick up spares is of vital importance in becoming a good bowler, this first ball average, if used, must be combined with other items.

Written Examinations

A written test gives the instructor an appraisal of the students' knowledge of rules, etiquette, scoring, and techniques included in the course. A few sample questions follow to illustrate types of questions that might be included in a written examination on bowling.

Scoring: Fill in the correct score in the following line, frame by frame, as indicated by the ball and number of pins knocked down.

Ball 1 -- 9 pins	Ball 7 -- 8 pins	Ball 13 -- 2 pins
2 -- 1	8 -- 2 foul	14 -- 10
3 -- 0	9 -- 7	15 -- 4
4 -- 10	10 -- 3	16 -- 6
5 -- 10	11 -- 10	17 -- 10
6 -- 10	12 -- 3	



History: (Circle the letter of the correct answer.)

At the time bowling was brought to America the pins were arranged:

a. In three rows of 4 pins each

b. In three rows of 3 pins each

c. Ten pins in a triangle

d. Seven pins in a triangle

True-false

Etiquette:
The person on the left rolls his ball first when bowlers on adjoining alleys are ready to bowl at the same time. T (F)

Delivery:
The thumb and fingers are released simultaneously when delivering a straight ball. T (F)

A medium speed ball is more effective than a fast ball. (T) F

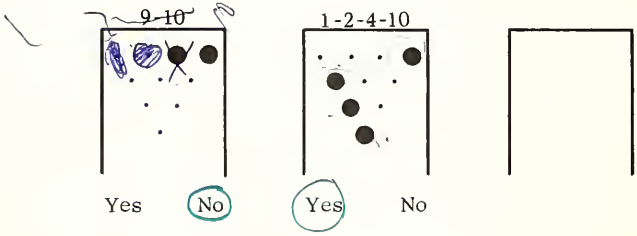
Matching

Match the letters in Group A with the statement in Group B to which it is best related. Letters may be used more than once.

A	B
A. Baby split	Failure to convert into a spare pins left standing after the first ball. C
B. Cherry	
C. Error (blow or miss)	Three strikes in a row. E
D. Striking out	
E. Turkey	Pins 2, 4 and 7 remain standing after the first ball is rolled. Pin 2 is knocked down with the second ball of that frame. D

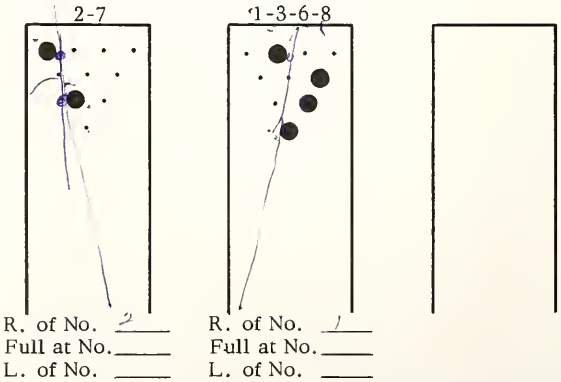
Recognition of Splits

On the following diagrams the dark spots represent pins standing after your first ball. By encircling "yes" or "no" under each of the diagrams indicate whether or not it illustrates a split.



Leave Conversions

The dark spots on the following diagrams represent pins left standing after your first ball. Where should your second ball hit to pick up your spare? Complete the proper answer with the correct pin number. One answer per diagram. The numbers of the pins standing are given above each diagram.



chapter 12

Leagues

Leagues may be composed of teams of two, three, four or five players. A two-man, or doubles, team may be either two men, two women, or a man and a woman. Doubles tournaments are popular during summer months when regular leagues do not bowl. Most ABC and WIBC leagues are composed of teams of five players, either five men or five women. Some teams have six members and use a rotation system in their weekly matches; one bowler is "off" each week.

Open Leagues

There are three specific types of leagues -- open, classified, and handicap. Of the three, open leagues are fewest in number, but by virtue of the caliber of bowler attracted to such competition they are the most selective. They do not limit team averages in the selection of members; consequently, every team tries to have the best available talent in its line-up. For the average participant and for the many organizations which find bowling an excellent medium for recreation, classified or handicap programs are better.

Handicap Leagues

A classified league limits its teams to a specified maximum average. Handicap leagues have several advantages not found in either open or classified leagues. They have greater flexibility in the matter of assembling teams and a broader field from which to select. Teams do not have to look for as exact a balance of team strength as do teams in classified leagues, because any reasonable range in average difference between teams can be offset by the handicap. The handicap program has, therefore, been widely accepted in social, fraternal, church, and industrial groups where the individual average variance may be as much as ninety pins or more.

Determination of Averages

A bowler's average is determined by dividing the total number of pins credited to him by the number of games he has bowled. For example, John Doe has bowled six games with a total of 906 pins. His average is 151, i.e., 906 divided by six. A team's average is the sum of the team members' averages. Individual and team averages must be calculated before handicaps are set.

Methods of Handicapping

A handicap system is based upon a maximum standard, from which each player's handicap is determined. This standard, called "scratch," depends upon the scoring ability of league members. Each league endeavors to arrange its handicap plan so that, throughout the season, scratch remains greater than the average of the most proficient bowler in that league. Men's leagues, composed of a number of high-average bowlers, set 200 as scratch; if league members have

medium or low averages, 190 or less may be adequate for scratch. There should be a difference of approximately ten pins between scratch and the average of the highest scoring player in the group.

Rarely is one hundred percent of the difference in team averages awarded the weaker team. Instead, to keep every member bowling his best, a percentage of the difference is used. This percentage varies from league to league, but a survey of ABC sanctioned leagues showed that seventy-five percent of the difference is the most widely accepted figure.

One simple method of calculating handicaps follows: members of team "A" average 149, 141, 136, 150 and 159 for a total of 735. Team "B"'s bowlers average 160, 155, 140, 163 and 165 for a 783 total. The difference between these totals is 48 pins (783-735). If the usual seventy-five percent difference is given, team "A" receives 36 pins (75% of 48) a game.

The ABC includes in its Handicap Manual charts that simplify the process of calculating handicaps. A chart from the American Junior Bowling Congress is to be found at the end of this chapter. The WIBC, like the ABC, leaves the percentage of handicap to its individual leagues.

Such elaborate systems are unwieldy for instructional class purposes. A simpler method follows: in scratch leagues allow the full difference between scratch and average, and set a maximum handicap of 20 pins for each participant. Thus, if a bowler has an average of 117 in a 130 scratch league, his handicap is 13 pins. If his average is only 107, his handicap is 20 pins -- the maximum. Scratch of 130, and the maximum handicap of 20 pins, may be changed to fit the level of ability of any group.

Alternating Alleys

In league bowling, members of contesting teams bowl one complete frame on one alley then, for the next frame, switch and use the adjacent alley. Players continue alternating each frame until the end of that game. Each lead-off bowler starts the second game on the alley adjacent to his original first frame. The reason for alternation is to permit everyone to bowl under similar conditions, to equalize any variance in the alleys and their playing surfaces.

After the third and last game of a series, scores are entered on an official score sheet. These records vary in form but are similar in format and may be obtained from the manager of the lanes.

Team Line-up

Just as the batting order of a baseball team follows a recognized pattern so does the line-up of a bowling team. The lead-off bowler should be consistent and especially steady in his spare shooting. The weakest player should bowl in the number three spot which takes much of the pressure off of him. The number four man should have a good strong average and be extremely steady. The "anchor" man should have the highest average and the ability to bowl under pressure when the difference between winning or losing may depend on that last frame.

Team Point System

Leagues score wins either on the basis of games won and lost or according to a point method. In the four point system, one point is awarded to the team winning each of the three games bowled, and the extra point goes to the team scoring the greater total number of pins for the series.

Any instructor who wishes to organize a league should contact the local officers of the American Bowling Congress (ABC) or the Woman's International Bowling Congress, Inc. (WIBC) in his community. The alley manager will be able to supply names and addresses.

BOYS' HANDICAP (180 minus 75% of average)

55-94	73-80	91-67	109-53	127-40	145-26	163-13
56-93	74-80	92-66	110-53	128-39	146-26	164-12
57-92	75-79	93-65	111-52	129-38	147-25	165-11
58-92	76-78	94-65	112-51	130-38	148-24	166-11
59-91	77-77	95-64	113-50	131-37	149-23	167-10
60-90	78-77	96-63	114-50	132-36	150-23	168- 9
61-89	79-76	97-62	115-49	133-35	151-22	169- 8
62-89	80-75	98-62	116-48	134-35	152-21	170- 8
63-88	81-74	99-61	117-47	135-34	153-20	171- 7
64-87	82-74	100-60	118-47	136-33	154-20	172- 6
65-86	83-73	101-59	119-46	137-32	155-19	173- 5
66-86	84-72	102-59	120-45	138-32	156-18	174- 5
67-85	85-71	103-58	121-44	139-31	157-17	175- 4
68-84	86-71	104-57	122-44	140-30	158-17	176- 3
69-83	87-70	105-56	123-43	141-29	159-16	177- 2
70-83	88-69	106-56	124-42	142-29	160-15	178- 2
71-82	89-68	107-55	125-41	143-28	161-14	179- 1
72-81	90-68	108-54	126-41	144-27	162-14	180- 0

GIRLS' HANDICAP (150 minus 75% of average)

36-86	59-68	82-51	105-34	128-17
37-85	60-68	83-50	106-33	129-16
38-84	61-67	84-50	107-32	130-15
39-83	62-66	85-49	108-32	131-14
40-83	63-65	86-48	109-31	132-14
41-82	64-65	87-47	110-30	133-13
42-81	65-64	88-47	111-29	134-12
43-80	66-63	89-46	112-29	135-11
44-80	67-62	90-45	113-28	136-11
45-79	68-62	91-44	114-27	137-10
46-78	69-61	92-44	115-26	138- 9
47-77	70-60	93-43	116-26	139- 8
48-77	71-59	94-42	117-25	140- 8
49-76	72-59	95-41	118-24	141- 7
50-75	73-58	96-41	119-23	142- 6
51-74	74-57	97-40	120-23	143- 5
52-74	75-56	98-39	121-22	144- 5
53-73	76-56	99-38	122-21	145- 4
54-72	77-55	100-38	123-20	146- 3
55-71	78-54	101-37	124-20	147- 2
56-71	79-53	102-36	125-19	148- 2
57-70	80-53	103-35	126-18	149- 1
58-69	81-52	104-35	127-17	150- 0

chapter 13

Equipment

Score sheets are normally provided by the establishment where classes are held, but valuable information such as pamphlets, record sheets, and various booklets can be obtained, usually at no cost, by writing manufacturers of bowling equipment or consulting the manager of the lanes.

Balls

Various materials are used in the construction of bowling balls but all balls must conform to specifications established by the American Bowling Congress. Each company selling bowling equipment has a special measuring device to determine the correct span and size of finger and thumb holes. These individual measurements are the most important factors in the selection and purchase of a ball.

Types of Grips

Balls can be bored to comply with various individual whims. There is a flat grip drilled so that the holes are flat instead of rounded on the side where finger pressure is applied. Curved finger grips allow the fingers in the ball to be bent at the first and second knuckles rather than at the second knuckle only as in the conventional grip. This position is supposed to give better control resulting from less hand strain and more lift due to the curved fingers. Off-set grips are specially drilled to give a natural hooking action to the ball. Semi-finger tip grips have a wider span than conventional grips, allowing the pressure from the inside edge of the finger holes to be applied against the fingers, between the first and second knuckle. Finger tip grips have an even wider span, and the finger holes are smaller because only the tips of the fingers (to the first knuckle) are inserted into the ball. Semi-finger tip and finger tip grips are designed to give more lift and turn on the ball, but this is frequently accomplished at the expense of control since the hand becomes fatigued more readily than with a conventional grip.

Gripping Aids

Inexpensive gripping aids of various types are also available. These may be purchased in paste form and applied directly to the fingers or they may be of a tape variety to be inserted permanently into the thumb or finger holes of the ball. In either case, manufacturers claim that the increased firmness of grip results in more lift and better control.

Balls for Juniors

Junior bowling balls for children are 22" in circumference and weigh from eight to ten pounds as compared to a 27" circumference and ten to sixteen pound balls for adults. An undersized ball assists juniors in learning fundamentals correctly without the handicap of the weight and size of a regulation bowling ball. Unfortunately, junior balls will not trip the mechanism of

automatic pin setting machines. Some establishments have regulation size, ten pound "feather-weight" balls available for young patrons.

Balls for Left-handed Bowlers

Balls are drilled differently for left-handed and right-handed bowlers. Since the span from the thumb to the ring finger is longer than the span from the thumb to the center finger, a left-handed person using a right-handed ball will find the span too wide from thumb to middle finger and too narrow from thumb to ring finger. Even if the span from one finger to the thumb is correct, the other finger will be cramped or stretched beyond normality. Unfortunately many bowling alleys have few or no balls for left-handed people with the result that many left-handers are forced to learn to bowl with a ball that does not fit. This is a tremendous handicap for, when the time comes to purchase his own ball, the left-hander has a distorted concept of the feel a ball should have.

New vs. Used Balls

Purchase of a new ball is the only way a bowler can be sure of obtaining a perfect fit for his hand. However, if a used ball is purchased, the inexperienced bowler should be discouraged from selecting a ball in which the original holes have been plugged and new holes drilled. Constant use will sometimes loosen the plug and destroy the ball's efficiency.

Balls that become scratched or defaced from use may be sent to the factory to be repolished and when returned, will look almost new. If the marks are deep, however, this process could make a noticeable difference in weight. Most lanes provide a mechanical ball cleaner that may be used for a very nominal cost. The function of this machine is not to be confused with the preceding process as the ball cleaner is merely used to remove surface grime and dirt. If not removed, foreign material adhering to the ball will eventually result in scratches and disfiguring marks. Privately owned balls may be personalized by having the owner's initials or name branded into them.

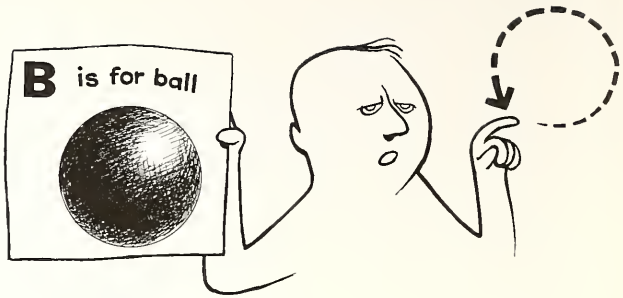
Shoes

Bowling shoes, which are a requirement in practically all lanes, may be rented or purchased but each bowler should attempt to secure his own. Various types of leather are used in shoes, from elk to kid, smooth or suede and shoes now come in most any color. If shoes are rented, ultra violet-ray machines should be provided for sterilization. This machine is essential in establishments where large classes are conducted.

Ownership of shoes and a ball form the basis of a bowler's equipment but there are other auxiliary items that he will continue to acquire. A shoe bag of leather, nylon, plastic, cotton tweed, duck, or canvas will provide a means of transporting shoes; or a combination bag of the same materials will solve the problem for both ball and shoes. Shirts and slacks, blouses and skirts or dresses round out the bowling attire.

chapter 14

Supplementary Instructional Material



Audio-visual materials of all description are available in most educational fields, and the teaching of bowling is no exception. Instructors with ingenuity can utilize many of these instructional aids to add variety and interest to the course.

Targets

Use of the string and target (Figure 58.), and the oilcloth chart described in Chapter III give graphic demonstrations of both the point of aim in spot bowling and the point where the ball must hit the pins to convert leaves to spares.

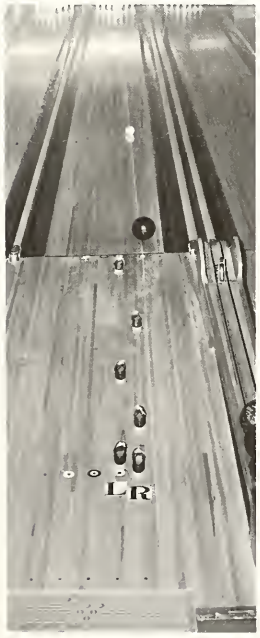


Figure 58. String and target assembly.

Brunswick-Balke-Collender Company manufactures two pieces of equipment that make it possible for an individual to practice alone on alleys having automatic ball returns and manual pin spotting racks. One is an auxiliary pit floor, slanted so as to roll the ball into the return opening. This permits shadow bowling (bowling with no pins standing) without a pin setter. The second item, a target-pin-assembly has four rubber pins suspended from a rod. This piece of equipment is placed above the pin deck so that the rubber pins hang over regular pin spots enabling a bowler to practice at various spare combinations. Both of these gadgets used together permit a bowler to practice at spare leaves, select spots for spare leaves and have the ball returned with no one in the pit. It is much less expensive and more profitable in many instances than game bowling. An ingenious instructor can construct both pieces of equipment.

Foot markers can be used to demonstrate the correct approach for both strikes and spares from various starting positions. Using the string-target and foot markers together make it a simple matter to show how errors in approach, release or aim are transferred to the ball. Large charts or drawings on a blackboard will serve much the same purpose.

Displays

Blackboards or bulletin boards offer a simple but effective means of posting high game scores, class averages, pin setting assignments, and other current information.

The Division of Girl's and Women's Sports of the American Association for Health, Physical Education and Recreation publishes a bulletin board chart, "Bowling Techniques," which shows action photographs of a four-step delivery.

Film Strips and Motion Pictures

If facilities are available, the use of film strips and motion pictures supplies excellent supplementary instruction. Two films on bowling that are valuable for instructional purposes are: (1) "Bowling Fundamentals," and (2) "Splits, Spares, and Strikes." "Beginning Bowling" a film strip, covers history, delivery, head-pin and spot bowling, scoring and etiquette. Use of this film strip should aid beginning students in analyzing their own difficulties.

Community Resources

Community resources may be drawn upon from time to time to further enrich the course content. City and state bowling associations supply valuable assistance in arranging with touring champions to meet with classes for lectures and demonstrations. Newspapers will furnish information regarding local and national tournaments. All such tournaments should be announced and intermediate and advanced bowlers should be encouraged to enter; out-of-school league and tournament competition add invaluable interest to the total bowling program. Students who do not enter tournaments should be encouraged to attend as spectators because they can acquire much information by watching experts in action.

Bowling has become a popular subject on television programs. From watching these offerings the enlightened spectator can learn many interesting and helpful facts but students should be cautioned that the expert in bowling, as in other sports, has progressed beyond the basic fundamentals and has developed his own style, which may include idiosyncrasies that should not be copied.

chapter 15

Sample Lesson Outlines

Beginning Course

The course content for beginning bowlers cannot be stated in hard and fast terms; each locale will need to make certain adaptations. These items should be included: instruction in a correct approach, delivery of a straight ball, how to pick up certain designated spares, spot bowling, scoring, terminology, history, and etiquette. The chief emphasis is on improvement in skill, and a consequent increase in individual averages and in enjoyment. Do not hurry a beginner. Give carefully planned, detailed instruction.

The following lesson plans assume that the maximum number of students per alley does not exceed five, and that one person from each alley acts as pin setter for that group. On lanes equipped with automatic machines eliminate pin setting procedures. Directions are given for right-handed bowlers only.

Lesson 1.

A. Make departmental announcements including the instructor's name and office hours.

B. Explain equipment and costume. Emphasize importance of shoes.

C. Select ball. Check each student's choice in regard to proper weight and span.

D. Assign each student to an alley.

E. Explain and demonstrate pin setting. Emphasize safety aspects.

Lesson 2.

A. Review proper grip.

B. Demonstrate four-step approach and delivery of straight ball.

C. Present footwork of four-step approach. Emphasize importance of keeping left foot on same board throughout approach.

D. Add arm coordination of straight ball delivery without a ball. Emphasize push-away.

E. Explain "range finders."

F. Have all students (one from each alley) take turns practicing four step straight ball delivery without a ball.

Lesson 3.

A. Review four-step delivery without a ball.

B. Practice four-step approach and delivery with a ball with only pins 1, 3, and 5 standing. (For left handers, use pins 1, 2 and 5.) Emphasize moving straight forward, keeping

hips and shoulders squarely facing the pins, using push-away, range finder point of aim and long follow-through. Rotate pin setters frequently.

C. Discuss velocity. Emphasize importance of medium speed.

Lesson 4.

A. Practice four step, straight ball delivery at all ten pins. Rotate pin setters. Emphasize keeping eye on point of aim.

B. Introduce second-ball cross-alley theory.

C. Practice bowling from the left of center at pins 3, 6, 9 and 10 or any combination of these pins.

Lesson 5.

A. Explain scoring. Use telescore if available.

B. Bowl, keeping score. Do not rotate pin setters.

Lesson 6.

A. Discuss bowling etiquette and further safety factors.

B. Bowl. Instructor gives individual assistance.

Lesson 7.

A. Post class average and scores of top three students.

B. Short written examination on scoring.

C. Bowl a line or more.

Lesson 8.

A. Film strip or motion picture on beginning fundamentals.

B. Discuss techniques shown in film.

Lessons 9 and 10.

A. Bowl. Instructor gives individual help.

B. Change alleys.

Lesson 11.

A. Discuss specific "leaves" including some splits.

B. Practice at the common leaves of 6-10; 5; 10; 7; 1-2; 6.

Lesson 12.

Continue practice at specific leaves from Lesson 11 plus 1-2-4; 4-7; 2-4-5; 1-3-6; 4; 3-10.

Subsequent lessons.

Game bowling, with emphasis on improvement. Post averages.

Final lesson.

Written examination.

Intermediate and Advanced Bowlers

If separate classes for intermediate and advanced bowlers are not possible, group these students together. However, within each class, maintain a division by assigning each skill group to a block of alleys. This arrangement facilitates instruction, and makes it possible to present new material to intermediate or advanced students without interrupting the rest of the class.

Intermediate Course

In an intermediate course include: review of material presented to beginning bowlers; technique of hook ball delivery; description and demonstration of a curve ball and a back-up ball; concentrated work on spare pick-ups; and practice at the more common splits. This material is covered in the following lesson plans.

Lesson 1.

A. Review grip and pin setting.

B. Assign balls and alleys.

C. Bowl. Check individual form.

Lesson 2.

A. Review fundamentals of four-step approach and straight ball delivery.

B. Bowl.

Lessons 3-7.

A. Concentrate on practice at specified leaves.

B. Discuss deflection and distances.

C. Bowl.

Lessons 8 and 9.

A. Present technique of hook ball.

B. Bowl, using four-step approach and hook ball delivery.

Lesson 10.

A. Short examination on scoring.

B. Film strip or motion picture, including technique of hook ball delivery.

Lesson 11.

Conduct class on a league basis.

Subsequent lessons.

A. Bowl, keeping individual and class averages.

B. Written examination.

Advanced Course

Advanced students need continued practice with much individual assistance from a trained instructor. Frequently these students are interested in joining a league, either on campus or in the community. A wise instructor encourages and directs this desire. Therefore, the advanced course includes opportunity for supervised practice plus information about varying alley conditions, handicapping and league procedures.

Lesson 1.

A. Assign balls and alleys.

B. Review fundamentals.

C. Bowl without keeping score.

Lessons 2-7.

A. Practice at designated leaves.

B. Bowl as many lines as time permits.

Lesson 8

A. Explain handicapping.

B. Bowl, using inter-alley competition.

Lesson 9.

Conduct class on a league basis.

Lesson 10.

A. Explain varying alley bed conditions and how to adjust to them.

B. Bowl.

Subsequent lessons.

A. Organize and conduct a tournament.

B. Written examination.

chapter 16

Brief Historical Development of Bowling

Photographs of 5000 B.C. show Egyptians engaging in an activity that resembles bowling. Bowling, thus, claims to be not only one of the largest participant sports but also one of the oldest. (Figure 59.)

Figure 59. An Egyptian game -- circa 5000 B.C.

It is known that the modern American game comes from an early religious ceremony that existed in Germany. At that time, all Germans carried a club, called a Kegel (or kegle), that was shaped somewhat like our Indian clubs. These were used as weapons, for recreation, and were twirled to keep the wrists supple and to strengthen the forearm.

The ecclesiastics called upon the German and his Kegel to prove that he was leading an honorable life. He stood his Kegel at one end of a long runway in the cloister of a monastary and, with a small, reasonably round pebble attempted to hit his Kegel, which was referred to as Heide (heathen). If the penitent missed, he had to return until he succeeded in abolishing Heide.

This religious custom was discontinued about the fifth century, but in the meantime the monks had discovered that it was good recreation to place their Kegels in a group and take turns with the pebble. Thus started the earliest known bowling contests.

It was not long before changes occurred. These changes included the use of larger pebbles, later replaced by wooden balls: the shape of the Kegel was modified; and the game spread from the churches to the upper class of laymen. Rules were introduced but much confusion arose from the fact that they varied from city to city; some parts of Germany used only three pins, while elsewhere the number of pins ran as high as seventeen.

In the fifteenth century, Martin Luther, an ardent bowler, published a set of rules and established nine pins, set in three rows of three pins each, as the official form which was in use for many years. Shortly after this, bowling at pins, as differentiated from bowling on the lawn, spread to the lowlands of Europe and into Austria, where it was played on alley beds of clay or crushed cinders. Bowling was still done mostly out of doors but in some places roofs were erected over the alleys.

Bowling at nine pins was brought to the United States by the Dutch. The exact date is uncertain but the casual mention of it in Washington Irving's Rip Van Winkle indicates that it must have been common before 1818. The Knickerbocker Alleys in New York in 1840 were the first indoor lanes in the United States. By this time the floors were baked clay, later replaced by wood.

Figure 60. The Dutch game of Skittles by Pieter De Hooch.

Some early sayings are as descriptive and colorful as our current vernacular. When it thundered, they said, "St. Peter is bowling"; If a man had nothing, "He has neither child nor 9 pin"; Their counterpart for "cart before the horse" was "he throws the 9 pin at the ball"; When a man died, "he has bowled out"; To express confidence in another's ability, "he knows how to bowl."

As has been true in many sports, gambling became so prevalent that bowling was almost ruined. Because of betting the Connecticut legislature prohibited bowling at nine pins and for some time it disappeared. Later some unknown hero thought of adding a tenth pin, thus circumventing the law against nine pins.

The popularity of bowling increased steadily and spectacularly. In 1895 the American Bowling Congress (ABC) was organized. Alleys, equipment, and rules became standardized. Data showing the growth of bowling in the first half of the twentieth century are almost unbelievable and give credence to the claim that bowling is one of the most popular participant sports. A chart of the American Bowling Congress team membership shows that each year since World War II the increase in number of teams has exceeded total team membership for the years 1900-1925. One hundred fifteen individuals competed in 1901; there are now over 50,000, and ABC membership is above a million and a half.

Despite this rapid growth, those connected with the commercial aspects of bowling were anxious to expand still further. They wanted the women's trade, but as late as the 1920's it was risque for a lady to enter a bowling alley. This taboo was typical of the mores of that age. Woman's place was still in the home; she was to be protected from contact with the "pool hall element" and bowling alleys were in that category.

World War I changed many things, including the occupations and recreational activities in which women engaged. They won greater freedom in vocations, politics, industry, and the professions. Gone were the days of the "clinging vine"; women were ready and willing to take their places in the world at large, including the world of sports. The American woman, having broken away from the shelter that had protected her mother, proposed to enjoy her social and intellectual freedom.

The Woman's International Bowling Congress (WIBC) was organized in 1916, and the increase in its membership is similar to that of the ABC. At the first WIBC Tournament in 1917 there were 200 members and that figure is now well above half a million.

Bowling alley operators had literally, as well as figuratively, cleaned up their establishments. Now, instead of the occasional alley with a floor reserved exclusively for "lady customers," men have to make their reservations early or all choice spots will be taken by women's leagues, ranging from housewives during the day to Classic and Major Leagues of the experts in the evenings.

Bowling is not exclusively for adults. Thousands of youths in 43 states bowl regularly in American Junior Bowling Congress (AJBC) leagues. AJBC members usually receive reduced rates and free instruction. P. T. A. groups are showing an interest in junior bowling and agree that it is an excellent outlet for some of the youthful energy that needs expression. One of the finest things about the program is that the young people learn the fundamentals of a game that they may enjoy long after they are unable to play such active sports as baseball, basketball, and football.

Bowling is for the oldsters, too, and is one of the few sports in which they can continue to participate. In present-day society, with its interest in gerontology, it becomes more than ever necessary for these people to find recreational activities that fit their physical capabilities. So, too, their increased leisure makes them a powerful factor in recreational activities that are not too strenuous. Among such activities, bowling ranks high on the list.

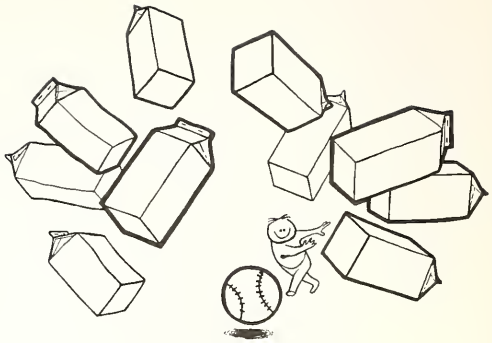
Bowling is also peculiarly adapted to take its place among sports for the handicapped. Many mild heart cases can bowl because it does not require long, sustained, physical effort. The Percy Jones Army Hospital in Battle Creek, Michigan, had a Wheel-Chair League, composed of patients suffering from paralysis. Nor are the blind excluded from participation. There is a National Blind Bowlers Association with leagues in many cities. A five pound, portable, inexpensive, aluminum, guide rail now on the market will enable even more such leagues to develop.

Valuable as this sport is in the areas previously mentioned, it fills at least one more important role in the lives of many Americans. The whole family can bowl together! Many teams are just that -- a family: a father and four sons, mixed doubles consisting of husband and wife, tournaments for father and son or mother and daughter. Many scorekeepers for women's leagues are husbands of those bowling and many wives keep score for their husband's team. Perhaps this has far reaching implications in the growing problem of juvenile delinquency. It has been said that a family that plays together, stays together.

In several respects bowling is ideal for such family participation: it is not essential to own any equipment, it is not dependent on weather, it does not require rigid training, father can come from a sedentary occupation without fear of straining his heart and mother can compete on almost equal terms even if she is not athletic. It is social, giving plenty of time for chatting and visiting between turns, and its etiquette, thoughtfulness for others, is a lesson important in all dealings with our fellow man. Not many sports can claim all of these values and advantages.

chapter 17

Lead-up Games to Bowling



Some lead-up games are presented here for their value in developing the basic bowling skills. Others are included because they offer a variety of opportunities to practice scoring. Still others have appeal only for their recreational value at home, in school or at parties. Individuals may have different reasons for making use of these games, but whatever that reason may be, they are all fun.

Bean Bag Bowling substitutes a bean bag for a ball. The bean bag is slid or thrown underhand at a triangle of milk cartons, plastic bottles or lightweight round sticks. The distance from the pins to the foul line will vary from 20 to 40 feet depending on the age and skill of the players.

Bowlite is played on any smooth surface inside or out. The rules and scoring are the same as in bowling except the distance from foul line to pins is shortened to fit facilities or the skill of players. Bowlite balls and pins are about the same size as standard balls and pins but their weight is about one-eighth as heavy. The ball is of lightweight rubber and the pins are of plastic. The complete set includes a ball, ten pins, one backstop, one set-up sheet and one score pad. (Commercial)

Candle Bowling is a party game for indoor use only. The player places his chin on the edge of a table, the foul line. Two feet away, ten lighted candles are spaced four inches apart. The player gets two blows per frame in an attempt to blow out all the candles. Scoring is the same as in the standard game.

Cocked Hat is played on regulation bowling lanes but uses only three standard bowling pins. These pins are placed three feet apart from center to center on the 1, 7, and 10 pin spots forming a triangle. A duck pin ball is rolled to the right of center of the head pin in an attempt to get a strike. A strike is scored when all three pins fall with one roll. The ball carries the 1 and 10 pins while the 1 pin carries the 7 pin. Cocked Hat is played and scored like regulation bowling except a strike counts three pins plus a bonus of the next two balls and a spare counts three pins plus a bonus of the next single ball. A turkey, three strikes in a row, scores nine pins. Twelve strikes in a row constitute a perfect game of ninety. Improvised Cocked Hat may be played on any smooth surface with substitutes for the pins and ball.

Cocked Hat and Feather like Cocked Hat is played on a standard bowling alley except that four pins are used instead of three. The pins are placed on the 1, 5, 7, and 10 pin spots. Another variation is in scoring. The five pin, feather, is taboo and must not be knocked down or the player's score suffers. This game is scored like Cocked Hat but if the center pin, feather, is toppled with either ball, the player scores zero for that frame. Improvised Cocked Hat and Feather can be played on any smooth area improvising where necessary.

Doorway Bowling can be played in any doorway. Ten milk cartons, plastic bottles or round sticks are set up in a ten pin triangle. The player stands behind the pins holding a softball suspended by a string from the center of the doorway. (When hanging freely, the ball would measure

about two or three inches from the floor.) The player drops the ball from any height so that it swings past the pins and hits the pins on its return trip. Two tries per frame are allowed and scoring is the same as in bowling.

Five Pins is played on any smooth surface. Five small pins are suspended in a single row from the crossbar of a tubular steel frame. A four and one-half inch rubber ball with one finger hole is rolled at the pins. When a pin is hit it swings around the crossbar and rests on a forward crossbar. Pins are numbered 2, 3, 5, 3, 2, from left to right. Three rolls are permitted in each frame: two rolls to make a strike; three rolls for a spare. A perfect score is three hundred as in the standard game. (Commercial)

Improvised Bowling is a method of bowling on any smooth surface indoors or out. Regulation bowling pins or a substitute may be used. Substitutes for pins are Indian clubs, milk cartons, plastic bottles or round sticks. Players roll a basketball, soccer ball or volleyball twice each frame at the ten improvised pins and score as in bowling.

Improvised Candle pins or Duck pins are played on any smooth surface inside or out as in improvised bowling. In all improvised games, the ball size should vary with the game being played. For example, in improvised Duck pins the ball should be a softball or equivalent.

Kick Ball Bowling is played and scored as in the standard game except a soccer ball is kicked at the pins or substitutes. The distance from the foul line to the pins can vary depending on the space available.

Knock 'Em Down was developed for practicing correct approach either on a bowling lane or in a gym. It may be played with regulation equipment or two Indian clubs and a seamless softball. The two pins or clubs are spotted in tandem in the positions of the 1 and 5 pins. Each team member gets two tries, if necessary, to knock down the two pins. If both pins are knocked down with one ball, five points are awarded. If two rolls are necessary, one point is scored for each pin toppled. At the end of a predetermined number of frames, the team with the highest score is the winner. There is one ball retriever and one pin setter assigned to each lane. These positions are rotated or exchanged frequently.

Marble Bowling is played by shooting a marble at ten golf tees from a distance of five feet. The tees are spaced about one inch apart depending on the size of marble used. Two attempts per frame are allowed each player and scoring is as in the standard game of bowling.

Play for Strike develops the delivery for a strike and any single pin leave the group may have difficulty converting into a spare. Each player has an opportunity to roll two balls. If he strikes on the first ball, he then rolls a second at the troublesome single pin leave, say the 10 pin. A strike scores ten points and the single pin leave scores five. If the bowler does not get a strike on his first ball, no bonus ball is taken and no score is recorded. The team or person with the highest score at the end of ten frames is the winner.

Progressive Bowling employs the element of progression by first rolling at one pin and eventually building up to ten. The first player of each team attempts to knock down the No. 1 pin. If unsuccessful the second player rolls at the same pin. If the first bowler is successful, the second player rolls at pins 1 and 2. Each player takes his turn in order and another pin is added with each successful attempt, until players are rolling at all ten pins. A successful roll is executed when all pins standing are knocked down with one ball. The first team making a strike wins. The game may be varied by rolling in order at each single pin in sequence until the ten pin has been felled.

Rob-O-Ling is a game which can be played on any smooth surface inside or out. An object called a skull, half a sphere with finger holes, substitutes for the bowling ball. The skull is slid on its flat surface at a standard set of bowling pins. The distance from foul line to pins can vary depending on the age and skill of the players. Scoring is the same as in bowling. (Commercial)

Setback is played on a regulation bowling lane or may be improvised on any smooth surface. Five standard pins are placed on a straight line nine inches apart across the base of the standard ten pin triangle (on the line made by the 7, 8, 9, 10 pins). The five pins are numbered from left to right. A duck pin ball is rolled at the five pins and three rolls are allowed for each frame. Strikes and spares are scored as in bowling but there is one major variation. The 1 pin, on the

extreme left, must be knocked down in each frame to score. If the one pin is toppled the score is cumulative as in bowling but if the 1 pin remains standing, the player receives a negative score for the frame.

Skittles is played and scored as regular bowling except the distance from foul line to pins is shorter and of indefinite length. A wooden disk five inches in diameter and one and one-half inches thick is slid or tossed underhand at the pins instead of using a ball.

Shufflebowl is a combination of shuffleboard and bowling. A shuffleboard pusher is used to push a disk at ten milk cartons, indian clubs, or plastic bottles. Play and score as in bowling.

Softball Bowling is played with two seamless softballs. One ball is placed twenty feet or more from the foul line. Each bowler takes his turn rolling one softball at the other stationary ball. A hit scores one point. The first player or team to get twenty-five points wins. This game can be played by substituting a pin, volleyball or other items as the target.

Spearing Spares provides a competitive opportunity for practicing at common or difficult leaves. Each bowler takes one turn in order, rolling at a designated leave. One ball is allotted per frame and the individual knocking down all leaves first is the winner.

Split Down gives all team members one roll at each of the following splits: 2-7; 3-10; 5-7; 5-10; 4-7-9; 6-8-10; 4-5; 5-6. Converting the split counts ten points; a miss is a zero. The team or individual with the highest score wins.

Strike or Spare It emphasizes the necessity of making marks for a respectable bowling score. Two rolls are allotted each player in turn but only strikes or spares are scored. A strike is worth ten points and a spare collects five. The first team to score fifty points is the winner.

Sugar Bowl employs an artificial bowling situation, while keeping the element of competition, to improve the fundamentals of the four-step approach. A sixty foot bowling lane with a fifteen foot approach at each end is placed on a gymnasium or playroom floor. A team of eight to ten players lines up at each end of the lane. Player No. 1 on team A rolls one ball at "Sugar Bowl," the two foot space between the legs of player No. 1 on team B, who is standing on the foul line sixty feet away. Players of each team take alternate turns rolling a soccer ball, volleyball, basketball, or softball, at the opposing team's "Sugar Bowl." Each player rolls one ball and then goes to the end of his line. A point is scored each time the ball passes between the legs of the opposition. The second person in each line retrieves the ball before taking his turn at bowling. The team with the most points at the end of a specified time limit or after a predetermined number of turns by each player, is the winner.

Three Pins tends to develop the strike ball aim. Either regulation or improvised equipment may be used. The 1, 2 and 3 pins are spotted with each bowler taking his turn in an attempt to hit the 1-3 pocket. Every player starts with twenty points. The total pins knocked down during a bowler's turn is subtracted from twenty. The player reaching zero first is the winner.

Tire Bowling is played either inside or outside but preferably outside. The area surface does not have to be real smooth. Bowling pins, Indian clubs, or round sticks are placed in a triangle as in the standard game. An old lightweight tire is rolled from behind a foul line 25 feet from the pins. Each player takes two rolls per frame and scores as in bowling.

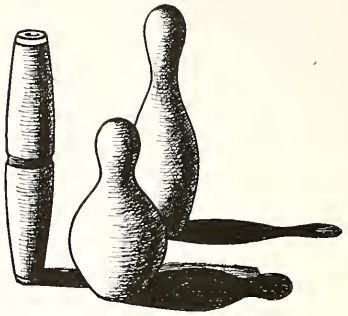
Triangle Bowling helps to develop consistent approach and aiming habits of bowling when standard equipment is not readily available. A regulation or smaller scaled lane is marked on the floor. Softballs or volleyballs are substituted for bowling balls. A two foot equilateral triangle, with its base on the floor is marked off on the wall at the end of the lane. A one foot equilateral triangle is placed inside the larger one. Each player receives two rolls per frame and receives ten points for hitting inside the small triangle and five points for hitting inside the large one. The team receiving fifty points first wins.

Win It is a team game designed to knock down all pins in the fewest deliveries possible. Regulation bowling equipment or improvised equipment may be used. The first player rolls for a strike. If the attempt is unsuccessful, the second player bowls for the remaining pins. Bowlers continue to take turns rolling one ball each until every pin is down. One point is awarded a team

every time the deck is cleared whether on the first or fifth ball rolled. The team with the highest score at the end of a predetermined time limit is the winner.

chapter 18

Duck Pin, Candle Pin and 5-pin Bowling



The game of American Ten Pins has the greatest number of participants, but both Duck Pins and Candle Pins have their devotees. Common elements of the three games are: the general concept of good form, the size of alleys, and the number of pins. Stance, starting spot, and delivery are practically identical. Differences occur in the size of pins and balls and in the method of scoring.

Duck Pin

Duck pin bowling is centered in the Eastern and Southern states, principally from Pennsylvania to Florida. From a modest start, the sport of Duck Pins has grown rapidly, as is evidenced by an increasing number of teams in the annual tournament.

In this game, pins are only nine inches high, but they are over four inches in diameter, which gives them a short, "squatty" appearance. Balls have no holes, are five inches or less in diameter, and weigh under four pounds. This lightweight ball makes Duck Pins an excellent game for persons with little physical strength. In duck pin bowling, most players use the head pin method of aiming and throw a straight, fast, cross-alley ball. Spot bowling, and the hook and curve balls of American Ten Pins are not advisable.

The chief difference in scoring is due to the fact that three balls per frame are allowed in Duck Pins. If all pins are knocked down by the first ball, it is a strike. If all pins are knocked down by the first two balls it is a spare. Marks (X, /) and bonuses are identical with those of Ten Pins. If pins remain standing after the first and second balls have been thrown, a third ball is rolled and the score in that frame is the number of pins knocked down by all three balls.

Candle Pin

Candle Pin bowling, prevalent in New England, is similar to the game of Duck Pins except that the pin is tall and thin, almost sixteen inches high and slightly less than three inches in diameter.

5-Pin

Another related game, 5-Pin bowling, although popular in Canada, has not gained widespread recognition in the United States. This lack of acceptance may be due to one rule -- if the king pin is left standing, no points are scored for that frame; so, until a high degree of accuracy has been reached, the player receives a limited sense of accomplishment. Balls and pins resemble those of duck pins. Five pins are arranged in a V with the point toward the bowler. Each pin is numbered and scores the point value of its number.

Each of these games has its own followers, but the twenty million Ten Pin bowlers overshadow all similar activities.

Selected References

Ainsworth, Dorothy S., et al. Individual Sports for Women. Third edition; Phildelphia: W. B. Saunders Company, 1955.

American Bowling Congress. Bowler's Manual. Milwaukee: American Bowling Congress.

Bourquardez, Virginia and Heilman, Charles. Sports Equipment. New York: A. S. Barnes & Co., 1950.

Day, Ned. How to Bowl Better. Greenwich, Connecticut: Fawcett Books, 1951.

Harben, E. O. The Fun Encyclopedia. New York and Nashville: Abingdon-Cokesbury Press, 1940.

Hutchinson, John L. Principles of Recreation. New York: Ronald Press, 1949.

Menke, Frank G. Encyclopedia of Sports. New revised edition. New York: A. S. Barnes & Co., 1953.

Official Sports Library for Women. Official Bowling Guide. Current edition. Washington: American Association for Health, Physical Education and Recreation.

Raymer, Milton. Curriculum for the Teaching of Class Room Bowling. Chicago: American Junior Bowling Congress, 1958.

Scott, M. Gladys. Analysis of Human Motion. New York: F. S. Crofts & Company, 1942.

Tunis, John R. Sport for the Fun of It. Revised edition. New York: A. S. Barnes & Co., 1950.

Varipapa, Andy. Quick Way to Better Bowling. Garden City, New York: Garden City Books, 1952.

Wilman, Joe. Better Bowling. New York: Ronald Press, 1953.

Glossary of Bowling Terms

ALLEY BED. That part of the alley between foul line and pit.

ANCHOR. Last bowler of a team's lineup.

APPROACH. That part of the alley extending 15 feet back from the foul line.

BABY SPLITS. 2-7, and 3-10.

BACK-UP. A ball that fades to the bowler's right as it travels down the alley.

BED POSTS (FENCE POSTS; GOAL POSTS). 7-10 split.

BIG FOUR. 4-6-7-10 split.

BLOW (ERROR; MISS). Failure to convert to a spare any leave other than a split.

BROOKLYN (CROSSOVER; JERSEY). A hit to the left of the head pin.

BUCKET. 2-4-5-8, or 3-5-6-9.

CALL THE MANAGER. Cry of a bowler when a good hit leaves one pin.

CHERRY (CHOP). To knock down, with the second ball of a frame, only the front pin or pins of a leave.

CLOTHES LINE (SNOWFENCE). 1-2-4-7, or 1-3-6-10.

COUSIN. Term applied to a bowler who fails to get the strike that would have given the team four strikes in one frame.

CURVE. A ball that travels to the pins in a wide arc.

DEAD WOOD. Pins left on the deck after the first ball of a frame.

DECK. Area of the alley where the pins stand.

DOUBLE. Two strikes in succession.

DOUBLE BALL. To roll a second ball before the pin setter is out of the pit.

DOUBLE PINOCHLE (in the West: GOLDEN GATE). 4-6-7-10. (same as BIG FOUR).

DUTCH 200. A game in which strikes and spares, or spares and strikes alternate throughout.

EASY ONES. A leave in which the pins are grouped.

ELECTRIC EYE. A mechanical foul detecting device.

FILL 'EM UP. Entreaty by team mates to bowler to mark in all remaining frames.

FOUL. Act of touching anything beyond the foul line.

FOUL LINE. A horizontal line separating alley bed and approach.

FRAME. Tenth part of a game.

FREE ONE. The extra ball following a spare in the tenth frame.

FULL HIT. A ball that hits the center of a pin.

GAME (LINE; STRING). Ten frames.

GIVE ME A FENCE. Request from a bowler to the score keeper for a line to enclose an open frame. Supposed to prevent further blows.

GIVE ME A PERIOD. Request from a bowler to the score keeper for a dot in the frame following one or more blows. Supposed to end the poor streak.

GOOD PLACE FOR IT. Refers to a split resulting from the extra ball following a spare in the tenth frame. Said in relief by a bowler because he does not have to try to convert it.

GRANDMA'S TEETH. 3-7-10, or 2-7-10 splits.

GUTTER BALL. First ball of a frame that rolls into either gutter without knocking down any pins.

GUTTERS (CHANNELS). Rounded areas on both sides of the alley.

HANDICAP. A predetermined number of pins given in competition to the lower average bowler or team.

HEAD PIN. Pin number one.

HEAD PIN BOWLER. One who looks at the 1-3 pocket during his delivery.

HOLD ME UP. Entreaty by a bowler who has failed to mark, to a team mate who is about to bowl.

HOOK BALL. A ball that breaks sharply into the pocket.

I ASKED FOR IT. Admission by a bowler that the split was deserved.

I WAS ROBBED. A bowler's lament when a good hit fails to result in a strike. Sometimes used in derision when a poor hit gets more pins than it deserves.

IN THE POCKET. A strike hit.

IN THERE ALL THE WAY. A ball that goes where it is aimed, and results in a mark.

KEGLER. A bowler.

KING PIN. Pin number five.

LANE. Alley

LEAD-OFF. First bowler of a team's line up.

LEAVE Pins standing after first ball of a frame has been rolled.

LINE. Game.

LOFT. To release the ball high above the alley.

LOOKS GOOD ON PAPER. Said to, or by, a bowler who scores a strike with a poor hit.

LOTS OF WOOD. A poor hit that knocks down more pins than it deserves.

MAKE IT FIT. Entreaty to a bowler to convert a split in which the open space is smaller than the diameter of the ball.

MARK. A strike or a spare.

NINE AND A WIGGLE. Remark used when nine pins fall, and the tenth pin wavers but remains standing.

ON THE NOSE. Refers to a ball that hits the center of the head pin, and results in a split.

ONE BOWLER ON THE TEAM. Said when only one member of a team has marked in a frame.

ONE ELEVEN (111) IN THE SEVENTH. A bowler with this score in the seventh frame is supposed to treat the team. (He never does.)

ONE IN THE KITCHEN. A sleeper.

OPEN FRAME. One without a mark.

PART OF THE BUILDING. Pin that remains standing after a strike hit.

PERFECT GAME. Twelve consecutive strikes, resulting in a score of 300!

PICK 'EM UP. Entreaty by team mates to bowler to get a spare.

PIE ALLEY. Term used when marks are more frequent in one of a pair of alleys.

PINS. The objects which a bowler attempts to knock down.

PIT. Area at far end of alley behind the pin deck.

PITCH. Angle of finger holes in a ball.

POCKET. Space between pins one and three.

SERIES. Three games.

SHADOW BOWLING. Rolling a ball without having pins set up.

SHORT PIN. Name applied to a fallen pin that spins near one that is still standing but fails to knock it over.

SLEEPER. The rear pin of the 2-8, 3-9 or 1-5 leaves.

SLIDE IT OVER. Entreaty to a bowler to convert a split in which the open space is larger than the diameter of the ball.

SNOWFENCE (CLOTHES LINE). 1-2-4-7 or 1-3-6-10.

SPAN. Distance on a bowling ball between thumb hole and finger holes.

SPARE. All ten pins knocked down with two balls.

SPLIT (RAILROAD). A leave in which the head pin is down, and one or more spaces remain between, or immediately in front of, standing pins.

SPOT BOWLER. One who, during his delivery, looks at a spot part way down the alley bed.

STRAIGHT BALL. One that rolls in a straight, diagonal line from the point of release to the pocket.

STRIKE. All ten pins knocked down with the first ball of a frame.

STRIKE OUT. A strike in the tenth frame followed by a strike with each of the two extra balls.

TANDEM. One pin standing directly behind another: 1-5; 2-8; 3-9.

TAP. A pin left standing on an apparently perfect hit.

TEL-E-SCORE. A device that pictures the written score on a screen above the alley.

THIN HIT. A ball that hits the side of a pin.

TIMBER. Call by team mates, or opponents, when a poor hit knocks down more pins than it deserves.

TURKEY. Three successive strikes.

UP THE HILL. Entreaty to the ball to break into the pocket when it has been rolling parallel with the gutter.

USE THE BIG BALL. Admonition to a bowler when he has left a split in which the open space is larger than the diameter of the ball.

WASHOUT. Split with the head pin standing. (Not a true split.)

WOOLWORTH. 5-10 split.

WORKING BALL. Term used to describe a ball that knocks over all the pins it deserves. Sometimes used in derision to describe a poor hit that knocks down lots of pins.

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